

HOW TWO GROUPS OF FISH DIVERGED

These reconstructions show the difference between the two groups into which the fish with lungs developed. *Diplopterus* ('Double-Wing'), above, had little use for a tail, and swam by movements of its body; whereas *Elonichthys* (one of the *Palaeoniscidae*, or 'Ancient-Cod') used its tail like a propeller.

STRANGE REPTILE THAT EARLY FAILED IN THE SUBMERGED EXISTENCE

We first recognize the true reptiles in the late Carboniferous and Permian periods. *Edaphosaurus* ('Ground-Lizard') was one of these early types, of further interest because it rapidly became extinct. For it has been observed that such useless excrescences as the spiny protuberances along its backbone often presage extinction, as if in the old age of a species the growth-force could no longer be controlled. The creature was only six feet long, monstrous though it looks.

Reconstruction after Cave

in Permian and Triassic times, inhabited arid regions.

The oldest great assemblage of such forms from the lowest Permian of North America and Europe includes no very large animals, the largest, *Dimetrodon* or *Edaphosaurus*, being only some six feet in length. Though they can be divided into two main and many subsidiary groups by anatomical peculiarities, they are all much alike in many fundamental characters.

The most primitive group, the *Cotylosauria*, is scarcely to be distinguished from the contemporary terrestrial amphibia; indeed it most closely resembles the Carboniferous amphibia from which they both sprang. Like them it had the head covered all over with a shield of bone, perforated only by the nostrils, the eyes and a gap on the top of the head for a third eye, whose remnant persists in ourselves as that pineal body which the old anatomists, as they could find no other use for it, regarded as the seat of the soul. In the other main group, the mammal-like reptiles, the bony shield covering the head is cut into by a pair of openings so placed

to side and rotated so that it acted like a screw propeller, or, more accurately, like an oar over the stern of a boat. The paired fins remained for a long time as stiff lateral projections, like the diving planes of a submarine, and indeed have never attained the flexibility and adaptability of those of the former group. The members of the latter group made little use of their lungs, perhaps because they soon migrated into the sea, where there is always as ample a supply of oxygen as in the air itself. From them arose the sturgeons, and also, in later times, the ancestors of

as to give the masticatory muscles, by which the animals moved their jaws, room for expansion.

All these reptiles were low-built, with short but powerful legs projecting out sideways so that the hands and feet could not be placed below the body. As a result of this arrangement the tracks that they made are wide and the stride extremely short; an animal about five feet in length had a track some sixteen inches wide and a stride of only some eight inches. Such a mode of walking is a waddle more like that of a tortoise than of any other living creature. These animals, however, are of the greatest interest because they include the ancestors of the mammals; indeed we can trace in the Permian and Triassic rocks of South Africa a continuous change in the structure of their descendants which results in the end in the development of creatures which are very nearly mammals.

The changes which bring about this result are very varied, and one of the most important of them cannot from its very nature be seen in fossil specimens. The reptiles, like all lower animals, have no

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From the Earliest Times
to the Egyptian Empire



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- C. LEONARD WOOLLEY, Director of British Museum and University of Pennsylvania Joint Expedition to Mesopotamia. Author of *Dead Towns and Living Men*. C. *Mesopotamia's City States Before the Rise of Babylon*.
- H. B. WORKMAN, D.Litt., D.D., Principal, Westminster Training College, London. Author of *The Evolution of the Monastic Ideal*. C. *The Papacy and Temporal Power*; *Church and Papacy: A Time of Unrest*.
- W. BASIL WORSFOLD. Author of *South Africa, etc.* C. *Africa in the Days of Vasco da Gama*.
- F. A. WRIGHT, Professor of Classics in the University of London. C. *The High Tide of Greek Life: From the Gracchi to Augustus*; *The Fathers of the Church*.
- F. DE ZULUETA, D.C.L., Regius Professor of Civil Law, Oxford University. Author of *The Study of Roman Law To-day*. C. *Rome as the World's Law Giver*.

The EDITOR'S FOREWORD

THIS History is an entirely new and original work. Indeed, its Editor may fairly claim that in form and content it is unique among histories of the world: a claim which a mere examination of its *Conspectus* will help to establish.

The effort has been made to tell in a new way the enthralling story of Man's performance in the drama of Human Destiny still playing on the vast stage of Earth. And the Editor believes that, ambitious though the project may appear when thus stated, the brilliant company of experts whom he has brought together have not failed him in their inspiring task. It has been required of each that he should describe or interpret the Past as vividly as the journalist chronicles the fleeting hour, but in that more correct perspective which only time can give.

Too often and too long has history been regarded, not by its readers only, but also by its writers, as a record of dead things. 'Let the dead Past bury its dead!' But the Past is not dead; it holds the Present in an iron grip, and what happened thousands of years ago in Babylon, in Memphis or Mycenae will influence generations of men not yet in being. Nay, unknown things that passed in the grey recesses of primeval forests many thousands of years before there was a Babylon or a Memphis still, in some measure, affect the life and thoughts of Man. It is the true office of the historian to disclose the living Past: to write of old and far-off things as though they were passing before his eyes here and now. At least, such is the conception of the historian's art that informs *THE UNIVERSAL HISTORY OF THE WORLD*.

OF recent years, and especially since the Great War, there has been a rising tide of interest in the study of history. This would appear to coincide with improved methods of writing and teaching history, of which it may well be the cause rather



than the effect. Up to the outbreak of the Great War, it was still thought worth while in works of history to dilate chiefly upon emperors, kings and 'battles long ago,' and to seek among such transient and seldom vital affairs for the main subjects of illustration. The intervening years, however, have witnessed such changes in scientific thought and the methods of presenting history and, since the conclusion of the War, such activity in archaeological discovery, that the need has arisen for an original world-history which will profitably explore these immense accumulations of new knowledge and examine the vast complex of Earth, Man and Civilization from a new point of view.

THE *UNIVERSAL HISTORY OF THE WORLD* has been planned and produced to meet this need, and its distinctive features can best be indicated in the following sequence:

(1) *A continuous narration of events* is achieved by dividing the period of record-history—during which Man has been making monuments, or compiling annals—into ten Eras, the history of which is told in a series of thirty-three instalments, entitled *Chronicles*, covering varying periods of time. Throughout these *Chronicles* history is treated as one great stream, into which flow numerous affluents, and if at times it is necessary to go to the source whence the newest tributary comes and to follow its course, we shall always in the end see it join the main stream. In our *Chronicles* we are concerned chiefly, though not entirely, with outward manifestations, with the shifting scenes of large and decisive movements in the life of nations, with events and personages. The principles underlying the events are sought out and expounded in

(2) *Our Interpretative Studies*. These Chapters, which are numbered from 1 to 191, are in every case the work of specialists whose peculiar knowledge of their subjects renders their judgements

worthy of acceptance, and makes the whole body of our Study-chapters unequalled for instructiveness and authority. It should be noted that these interpretative Chapters are not necessarily circumscribed by the dates of the Chronicles to which they are appended; they range back or forward in time at the discretion of their writers. Each Study-chapter is introduced at the moment in history when it has become important to the true understanding of the narrative embodied in the Chronicle. We travel 'down the corridors of Time' accompanied by the scholars who can best interpret to us the spirit of the times through which we pass.

(3) *Our Pictorial Documents* also form a vital part of the work, and have been sought for with the single aim of illustrating and amplifying the text. Though mounting into many thousands, none of them is without its special significance; and care has been exercised to include only such illustrations as would pass the scrutiny of a scholar, although presented in a form that attracts and engages the interest of the 'general reader.' The illustrations, indeed, are as much a part of the fabric of our History as the text itself, and only those who have had the task of aptly illustrating a book can guess what patience, energy and expert knowledge have gone to assembling from all parts of the world the many thousands of historical documents that find a place in *THE UNIVERSAL HISTORY OF THE WORLD*.

No existing conventions have been followed in determining the division of our work. Excluding the two Introductory Studies by Professor Macaulay Trevelyan and Sir Flinders Petrie, our History contains, in all, twelve divisions covering the story of Earth and Man from the mysterious half-guessed origin of things down to the events of our own day. The two opening divisions—'Before History Began' and 'Some Aspects of History'—which are concerned with much that lies outside record-history, *but with nothing not essential to the proper understanding of history*, are printed as preliminary studies to the historical divisions. Even at the risk of allowing them to appear an unusual mass of introductory matter, these two important divisions have not been included in a consecutive

numbering, so that the ten succeeding divisions, each comprising one of the ten Eras into which the period of record-history has been divided, might bear the numbers of their natural sequence, 1 to 10, and thus simplify our editorial scheme.

At an important conference of the American Historical Association in 1926 the 'long and slow decline' of the public interest in historical writing—a phenomenon that must be peculiar to America, the reverse being observed throughout Europe and the British Empire—was the subject of discussion, and it was held that historians were themselves to blame by having dissected and subdivided history after a fashion dear to the scientific heart, but 'repugnant to normal human interest.' It was said that the ordinary man craved two things: 'a general synthesis whereby he might at least see history steadily and whole, and the return of that old-fashioned preoccupation with the leaders of the race which used to stimulate the imagination and give the personal note which most readers still desire.'

THE UNIVERSAL HISTORY OF THE WORLD goes a long way toward removing the cause of the complaint against the coldly scientific style and to meeting the asserted craving of the 'ordinary man.' But the ideal of the American critic is not entirely ours, as that would tend over-much to make history merely a chronicle of heroes; and although many of our chapters are concerned with the character and achievement of great men, we largely interest ourselves through all the ages in the life of the common folk. This we deem not less important than the more spectacular lives of their heroes, leaders or oppressors. Thus *THE UNIVERSAL HISTORY OF THE WORLD* might be described as chronicling the progress of Mankind throughout the ages against a background of social life. And in this term is included all that relates to religious beliefs and practices, the arts and literature, industry and commerce. In this way nothing has been admitted to our pages that can be 'repugnant to normal human interest,' nor yet anything that can derogate from true scholarship in the process of being interesting and 'alive.'

J. A. HAMMERTON

CONSPECTUS OF THIS WORK

THE contents of The Universal History of the World are briefly set forth in these four pages. Here are displayed the titles of its twelve editorial divisions, and the descriptive names and dates of the 33 Chronicles into which the ten Eras of general narrative have been divided; together with the titles and authors of the special Studies that follow each Chronicle and interpret the principles underlying the events narrated, or amplify the purely historical information by sketching more vividly the religious, social or aesthetic background of the times. The figures in italics indicate the page in which each chapter begins.

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WHAT IS THE USE OF HISTORY?

A Question to which an Answer is offered by
an eminent Historian in this Introductory Study

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Regius Professor of Modern History in the University of Cambridge; Author of *History of England*, *Garibaldi and the Making of Italy*, etc.

WHAT is the use of History? What end is served by this branch of study, which partakes of the nature both of science and of literature? Does it fall between those two stools, or has it both those strings to its bow, and a value of its own as well?

The uses of pure science are clear enough. It has taught us how to supply food, medicine, clothing, locomotion, means of correspondence to innumerable millions who could not, without the aid of modern science, exist in such numbers upon the surface of the earth. It increases the material well-being and comfort of Man, besides adding enormously to his powers of self-destruction when the mad fit seizes him. For good and for evil the modern world is the creation of modern science. The practical uses and abuses of the discoveries of physical science are plain to all of us, over and above the value we may each be inclined to ascribe to the instruction of the human race in cosmogony and the laws of nature, and the philosophic deductions that can be made therefrom.

The uses of pure literature are also clear—to give delight, solace and elevation to the thoughts of Man, to charm his leisure, to educate his mind and soul.

But what is the use of History? It cannot do what pure science can. Its discoveries add nothing to the material power and well-being of our race. Even the most 'scientific' form of History—modern archaeology—is scientific in its methods alone, and cannot claim for its results the practical importance belonging to the discoveries of physical science.

When Sir Arthur Evans discovered the long-lost civilization of ancient Crete, he did nothing to prepare any change in the

economic fabric of society, nor did he enlarge in any respect the command of Man over nature. The sole value of his discovery lay in the enlargement of the scope of Man's thought and in the increased brilliancy of Man's imagination about the past. Wasp-waisted girls jumping over bulls in crowded arenas four thousand years ago, upper-floor drainage in the Palace of Minos or Alcinous—these are new and stirring visions for us all; but they leave the world of to-day materially unchanged. They feed our minds but not our bodies.

Regarded as a science, History cannot, therefore, claim the same importance for its results as those claimed by physical science; neither can History claim for its results *Can History be or methods the same called a Science?* accuracy or certainty as those of the laboratory. A gas or a black-beetle can be completely and accurately analysed. A revolution or an epoch cannot. A revolution or an epoch can only be portrayed in the most inadequate and external fashion, even by the most 'scientific' historian; for he cannot ascertain more than a billionth part of the innumerable 'facts' that went to cause and compose the epoch or the revolution which he undertakes to explain. A scientific analysis of the French Revolution would require, among other things, a knowledge of every conversation which had taken place in Western Europe for several centuries.

The reason why an historian's work is worth doing at all, in spite of its necessary incompleteness and inaccuracy judged by scientific standards, is that a revolution or an epoch is much more interesting than a gas or a black-beetle. They are

more highly developed and more spiritual portions of the world of nature or of God. But for that very reason they cannot be so clearly and accurately analysed as the gas and the black-beetle.

History is a science, in so far as the spirit in which the very imperfect evidence is collected and collated should be a scientific spirit. But beyond that, when it comes to interpretation and results, we are in another sphere, and the analogy of the physical scientist fails any further to apply to the historian.

But if History is handicapped in both its methods and its results when judged as a pure science, it is handicapped also if considered as pure literature. There need, it is true, be no limit to the amount and quality of literary genius or talent employed by the historian—as Thucydides and Tacitus, Gibbon and Carlyle, have shown. And there is nothing in modern historical method to prevent a repetition of similar work, except the non-recurrence of men of the same magnitude—a difficulty which afflicts other branches of art.

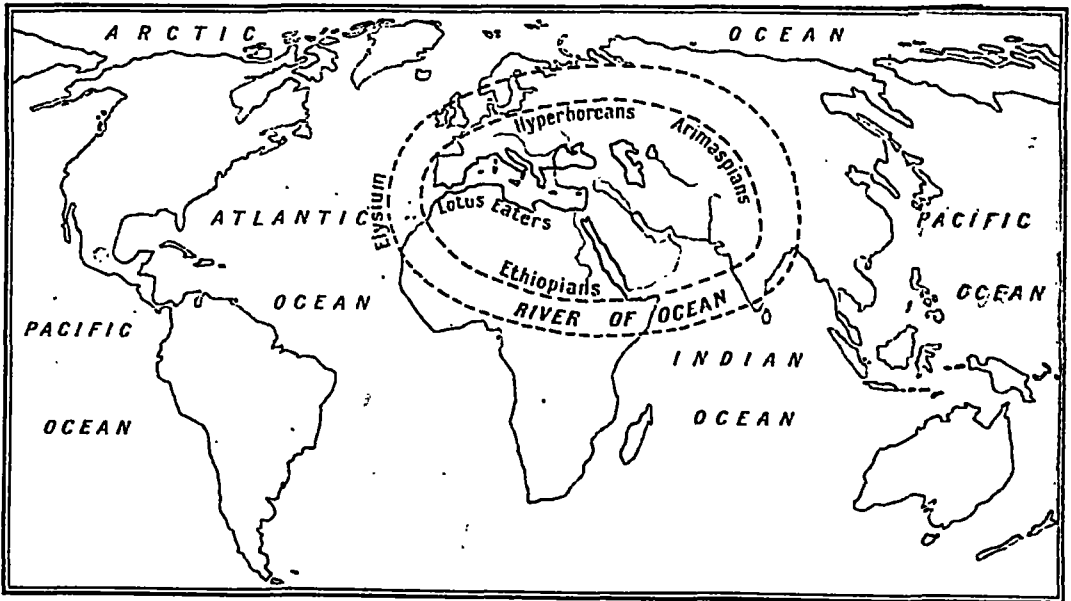
But History has not, and never has had, the same literary freedom as pure literature. It must be the slave of the fact, or it loses the name of History. The

material for its narrative must be supplied not by the imagination—as in poetry and fiction—but by the severe and scientific method used for eliciting the actual truth about the past.

It is seldom that the historian, even the biographical historian, can be as intimately at home behind the scenes of the human drama as the novelist or dramatist can be in the hearts of the characters which he himself creates. Cromwell may have been as interesting a human being as Hamlet, more interesting, indeed, because he really existed. But we can never know Cromwell as well as we know Hamlet, because the records of History are less intimate than those of fiction.

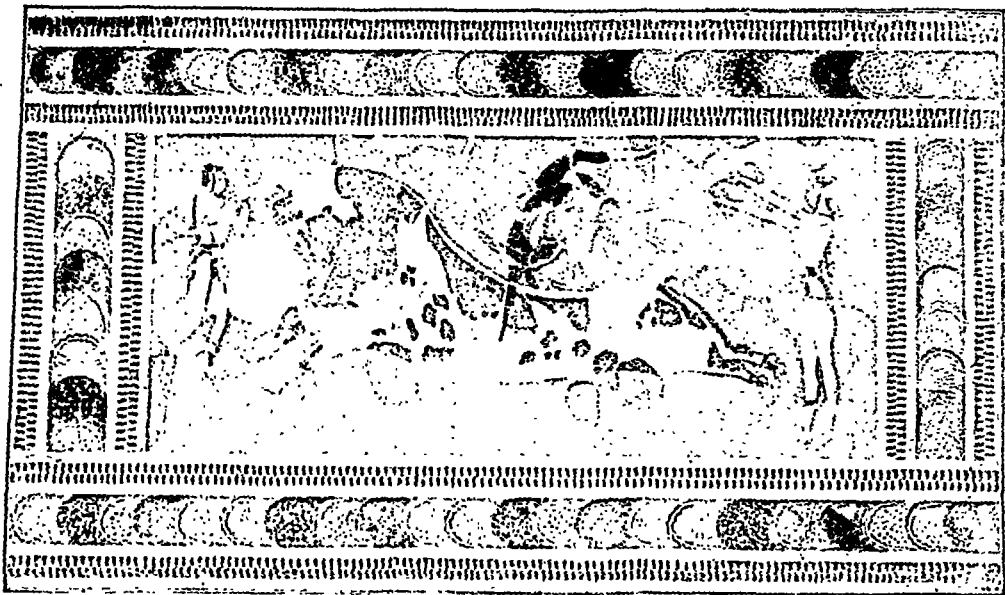
Shakespeare, indeed, has dealt in historical themes. He has made us know Richard II and Mark Antony through his own imaginary version of them. But History's version is much more blurred and sketchy in its portraiture of those two persons. Shakespeare has never attempted the historical method, but has employed poetry and fiction on an historical subject. That, of course, is not historical truth, though History may have inspired it.

On the other hand Boswell's Johnson is the real historic Johnson saying the things



THE WORLD AS IT IS AND WHAT HERODOTUS KNEW OF IT

History is not limited by space. In the tiny area left white above, where in the fifth century B.C. the Mediterranean was the centre of a narrow world bounded by myth, Herodotus had parented the science and Thucydides, his younger contemporary, perfected it. Yet consider how its scope has broadened since then, with the whole world for its field and twenty-three more centuries to chronicle.



FRESCO THAT MAKES THE DEAD PAST LIVE : THE CIRCUS GIRLS OF CNOSSUS

To seize the horns of a charging bull and clear the broad back with one swift somersault into the arms of a waiting comrade ! Rough sport ; yet the girls who thus performed in the arenas of Crete more than 3,000 years ago have been made a living part of History by the labours of the archaeologist.

In this fresco from Cnossus the girls are distinguished from the man by their light flesh tints.

From H. T. Bossert, All Krete

that he actually said, leaving on the reader the impress he left on his own friends in the real world. Boswell, therefore, is one of the great historians, for he has recorded truly the form and pressure of a real man with the intimacy and realism that are usually found in fiction alone.

Besides its limitations in the power of intimate portraiture of persons, History as literature suffers from another disadvantage. The forms and arrangement of the story cannot be carried out exactly as the literary art would require. The dénouement is often delayed ; the crisis, two times out of three, is lost in shallows and in miseries. 'Artistic truth' has perpetually to be twisted and cut short to suit the iron demands of historic truth.

On rare occasions, indeed, historic truth is stranger, more dramatic, more satisfying, more poetic than any fiction could have been. When one of those lucky moments falls into the hands of a great master of historical narrative, like the Revolution of 1688 into the hands of Macaulay, we get an unusual satisfaction, when art and history move for a while in perfect harmony. But those are the rare and fortunate chances. History, at

its best, is literature ; but it is literature in trammels, in trammels to hard fact.

Yet it is this relation to hard fact which gives History its value, and justifies its claim to amuse the leisure of readers and to occupy the life and work of students. Our interest in History depends on our belief that it represents, however imperfectly, events that once had real existence in time and space.

Now, to give a true picture of any period in the past, there is need not only of the scientific spirit to collate the evidence, but of the literary art to paint the picture that emerges. For the living truth about human beings in the past, with all their complex affairs and affections, cannot be given solely in statistics nor in a dead category of facts. The past was warm and actual, and the historian must represent it warmly or he gives an impression that is partially false. Dull history is false history, for the past was not dull when it happened. Cold history cannot be accurate history, for the past was hot and living. Yet hot history is equally misleading if its heat is that of modern partisanship or individual fancy, and not a reflection of the heats of the actual past.



RECORDERS OF THINGS SEEN

Herodotus, the observant traveller ; Caesar, the brilliant narrator of his own campaigns ; Clarendon, the Restoration statesman ; and Burnet, who wrote his memoirs a generation later—these four typify the eye-witness turned historian.

History is therefore the most difficult of all forms of authorship ; for it requires a union of scientific and literary methods never found to perfection in a single historian. In one sense Gibbon is nearly 'perfect.' He seems to have so few faults either in his science or in his art ; yet his 'perfection' is gained on condition of limitations of scope and sympathy which render his picture of fifteen centuries very far indeed from complete. There are therefore no perfect histories.

Failing that, there should be a great variety of types of historian and of types of history. Many different imperfections are the best substitute for unattainable perfection. A single man of science may understand all there is to understand about the beetle's body ; but no single historian can understand all that there was in the mind of an epoch or of a nation. The past of mankind is too great for any single brain to take it in.

The object of History is to give a series of true pictures drawn from the infinitely

various and wonderful life of Man upon earth before our own age. The myriad types of human society, circumstance and thought that have existed on earth, so different from one another as well as from our own—to teach this is the great object of History ; and to show also how and why these types and conditions of life constantly changed, slowly evolved, or were violently broken and replaced. The manner of life of those who were before us, in its difference and its likeness to our own—that is the supreme interest of History. The narrative of events, however stirring at times, is interesting chiefly as it illustrates and explains the more general theme of what our ancestors were like.

A mere string of events, political and military, of which too many so-called histories consist, the names of battles and kings, of ministers and states that rose and fell, have their chief value as the necessary skeleton on which to hang more important knowledge. Yet two hundred years ago History consisted of little else ; it was a



FOUR MASTERS OF STYLE

With Gibbon, who dissected the Roman Empire 1,300 years after its fall, we rank Macaulay—picturesque if often partisan—and Carlyle with his theory of individual greatness ; while Prescott devoted his gifts to the early history of America.

mere 'chronicle.' The progress of physical science since the day of Newton's birth has indeed been no greater than that of History in the same period.

In Stuart times the only works of real historical value, by modern standards, were contemporary memoirs, like Clarendon's and Burnet's. Men understood the events they had themselves witnessed, and recorded them in a noble English prose of which we have lost the gift. But the remoter past was hardly understood at all. Lists of kings and battles made it up, and no one realized how much the epochs of each of those kings had differed one from another. Lear, Canute, Henry II, Charles I—it was all one.

Human nature no doubt is constant, but it is not as constant as all that. In early Stuart times artists could still represent the persons of five and ten centuries back dressed in the same clothes and armour as themselves. In some old books, a single print of a battle being fought at push of pike was reproduced



SCIENCE ALLIED TO HISTORY

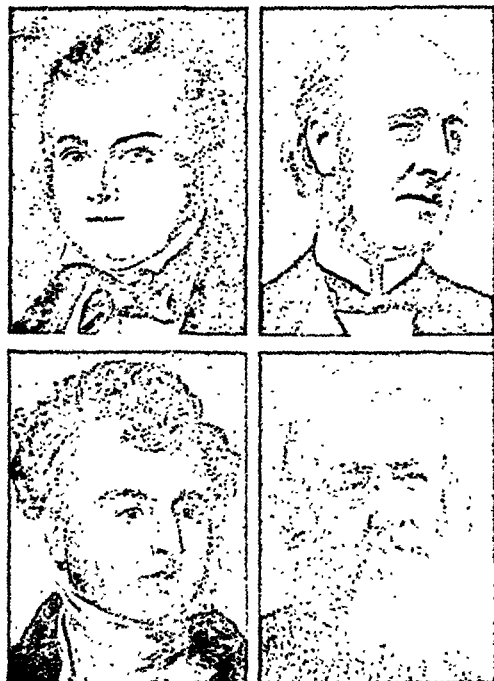
Thucydides was the father of scientific history. With Teutonic thoroughness Mommsen made Rome his theme. Maitland stands for the investigation of original documents, while for Sayce archaeology unlocks the remotest past.

Photo, bottom right, Elliott & Fry

again and again to represent ancient, medieval and modern wars. That was but an outward and visible sign of a complete spiritual ignorance of the real past.

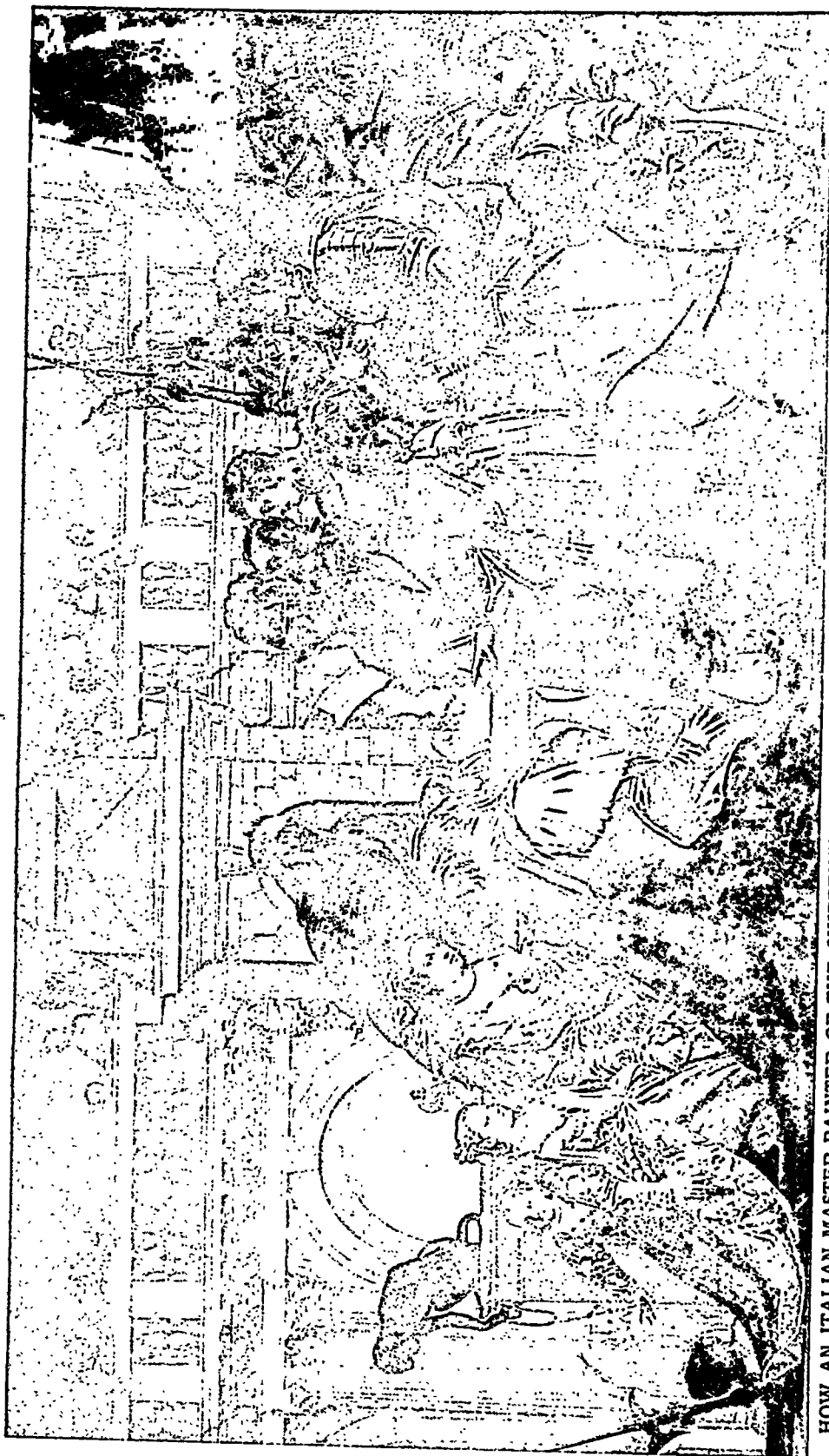
The antiquarianism of the eighteenth century first began to improve this state of historical ignorance. Publications like Percy's Reliques of Ancient English Poetry prepared the way for Walter Scott, who first popularised the idea that each passing age has had its own peculiar form and fashion, not only of dress and armour, but of thought, custom and character. The change wrought by Scott in men's conception of the infinite variety of the past is illustrated by a comparison with his great predecessor, Gibbon.

Gibbon, for all his vast and accurate scholarship, does not realize how different the men of the third century were from those of the eighth, those of the eighth from those of the eighteenth. In every century that he describes so clearly, so sardonically and within certain limits so accurately, man appears very much the



STUDENTS OF HUMAN SOCIETY

As annalists of man's institutions there stand out Buckle, Lecky, Grote and Freeman. The first two took England for their field, Grote made Greece a vehicle for the praise of democracy, and the last was a brilliant political historian.



HOW AN ITALIAN MASTER-PAINTER OF THE SIXTEENTH CENTURY VISUALISED ALEXANDER THE GREAT AND A PERSIAN HAREM

Anyone unacquainted with this picture would take it for some scene in a city of Renaissance Italy; and there is no need for special knowledge of the Renaissance to recognize it as the product of an age of culture, when the technique of at least one art was profoundly understood. Yet it is actually the famous painting, now in the British National Gallery in London, of Alexander and the Family of Darius, by Paolo Veronese (1528-1588). It brings vividly home the great strides made by History in modern times, when one realizes that an age which produced such a masterpiece could yet be so utterly out of sympathy with the past as to represent in its own garb and setting the men of almost two thousand years before.

same sort of fool. But in fact his folly has taken different forms with each passing age.

Sir Walter Scott did more than any professional historian to transform men's conception of the past. To understand this, we must remember that Scott was a sound and learned antiquarian long before he became a poet or a novelist. His lays and romances were the means by which he popularised his historical learning. He had a passionate lover's vision of the past, of the infinite colour and variety of the stages through which Man's history had moved in all the wide, mysterious lands of Europe. That vision had come to him through his own antiquarian studies, and through the spirit of the age which was beginning to look back upon the past with more intelligent and discerning eyes.

The patient antiquarian scholarship, which the eighteenth century had fostered on amateur lines, has developed since Scott's day into a thousand flourishing branches of endowed research, and has been given the rather forbidding title of Scientific History. Call it what you will, it is one of the great formative influences in our latter-day civilization.

This closer knowledge of the past plays an immense part in modern thought, controversy and education. No reform move-

ment, no propaganda—

History's part in modern thought political, religious, social or nationalist — can be

started to-day without some appeal to History, often, I am bound to say, grossly inaccurate and one-sided. It is one of the functions of true History to correct those exaggerations. In education and in the fostering of ideals for the present and future, knowledge of the ideals of the past is a principal source of inspiration.

It works in a thousand different ways, far beyond the realm of the historian's study, whence it originates. Even before the rise of modern History, the course of the world had more than once been deflected and its greatest movements had been inspired by historical study. The Renaissance of the fifteenth century was a rediscovery of the literature and ideals of ancient Greece and Rome, which had been buried during a thousand years of deep

historical ignorance. The Reformation, particularly the popular Reformation in England under Elizabeth and the Stuart kings, was the study by squires and merchants, ploughmen and tinkers, of the sacred books of the Hebrews, written many centuries before—truly the most astonishing feat of historical popular education there has ever been, to which our own times afford no parallel.

Those two examples of the Renaissance and the Reformation remind us that the literature of past ages, when it is available, is the most living and the most accurate form of History. Homer and the Bible are 'original documents,' far more enchanting than any modern histories that can be composed out of them or around them. In their surviving literature the men of the past speak direct to us, enunciating that part of their wit, wisdom and experience which they themselves thought best worthy of record. Listen, and you become indeed 'the heir of all the ages.'

One great function of modern History is to elucidate the literature of the past to the modern reader, by placing it in its proper setting of bygone circumstances. Fully to understand the Bible, Homer, Aristophanes, we require to be told what modern scholarship has discovered about social and political conditions in ancient Palestine, Asia Minor and Athens. How immensely our delight as well as our understanding is increased when we read these books in the light of that knowledge. The intellectual pleasure of reading the great literature of past ages, be it Chaucer or Dante, Shakespeare or Milton, is doubled by historical knowledge of those times. Nor is there any better way of obtaining historical knowledge than by reading portions of History as a comment on great works like those.

Even 'if the Iliad and Odyssey were all fiction,' says Professor Gilbert Murray in that most imaginative and entrancing of works of scholarship, *The Rise of the Greek Epic*—'if the Iliad and Odyssey were all fiction, we should still learn from them a great deal about early Greek customs, about practices of war and government, about marriage,

land tenure, worship, farming, commerce and, above all, the methods of seafaring. Let anyone read thoughtfully the story which Eumæus, the swineherd, tells of his life in Book XV of the *Odyssey*, and then consider how much history of the life of the Aegean, about the seventh century B.C., he has learnt from three pages of poetical fiction.'

In this way History and literature are closely connected. To divorce them is to impoverish both. Even economic his-

torians, like Dr. Clapham and Mr. and Mrs. Hammond, make constant appeal not only to

statistics and Blue Books, but also to the novels and literature of the eighteenth and early nineteenth centuries as valid contemporary evidence of social conditions and class relationships. How much, indeed, the pleasure of reading Defoe and Fielding, Miss Austen and Dickens, is increased by familiarity with the social and even the political history of the times when their works were written !

And how much light do those works throw back on History ! No reader of Mansfield Park will ever make the mistake of supposing that the country gentlemen and their families were concerned and troubled about the Napoleonic Wars in the way in which all classes were necessarily concerned and troubled about the Great War of our own day. And History proper, if we consult it, will confirm and explain the reasons for that circumstance.

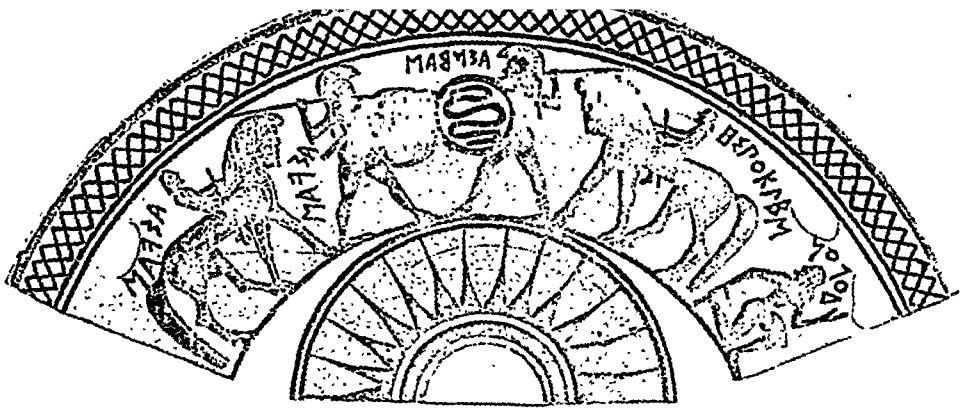
Who can understand those large parts of Wordsworth's *Prelude* that deal with the politics of his stormy youth, unless they know something of the history of England under Pitt and of France under Robespierre ? Who can interpret large portions of Shelley and Byron without knowledge of the politics of the Holy Alliance and the Regency ? Much of George Borrow and most of Peacock are unintelligible to persons wholly ignorant of the history of England under George IV and William IV. And those two delightful writers died well within the memory of persons still living. So fast does literature become history, or require at least the comment and exegesis of the historian !

What is the passion that inspires the historian to devote his life to his favourite study, and what is the motive that creates the demand in others for the results of his work ? It is the desire of man to emancipate himself, at least in imagination and knowledge, from the doom pronounced upon him at his birth of lifelong imprisonment in a single century and in a single set of social, material and intellectual circumstances.

Who can see the green earth any more
As she was by the sources of Time ?
Who imagines her fields as they lay
In the sunshine, unworn by the plough ?
Who thinks as they thought,
The tribes who then roam'd on her breast,
Her vigorous, primitive sons ?

✓ Well, if we cannot see it any more, we can dream it, with as much accuracy as the help of the archaeologist renders possible. We mount the primitive encampment beside the dew-pond on the Downs, and recall the life of the 'primitive vigorous sons' of earth who reared it to defend their flocks and families against wolf and bear and neighbouring tribe. We trace the Roman road now running green through the silent countryside ; we find the foundations of villa and temple in the woods that have hid them for so many centuries. But in dealing with those early times in Britain much has to be left to the imagination, working within the lines traced by the spade of the archaeologist. Rudyard Kipling's imagination helps out Haverfield's knowledge, to picture to us the life on the Roman Wall or, by a further stretch of imagination on a yet smaller basis of knowledge, life in the primeval days of the 'Knife and the Naked Chalk.'

As we approach nearer to modern times, the intensity of true historical interest increases, because the realm of knowledge, as distinct from that of imagination, becomes greater. Imagination is still brought into play, but it works on a far more solid and broad basis of known fact. As first the written and then the printed records of later years accumulate, our knowledge of our ancestors ceases to depend on deductions made from a flint,



WORLD'S OLDEST HISTORY MISREPRESENTED ON AN ANCIENT GREEK VASE

Till modern times, the value of Homer as a storehouse of information about early Greek thought was as little appreciated as by the Corinthian of the seventh century B.C. who put his quaint ideas into this vase-painting. To take but one point, Homeric heroes used chariotry and not cavalry. To-day the Iliad and the Odyssey are treasured by historians no less than by lovers of great poetry.

From a vase in the Bibliothèque Royale, Brussels, after 'Monuments Piot'

a carved stone, a skeleton or a spear-head dug up at a certain position.

Contemporary chronicles of political history, economic and legal documents, enable the historian to reconstitute a series of detailed and accurate pictures of successive states of society, each profoundly different in material and intellectual circumstance and organization from the society in which we live our lives to-day. The variety of Man's experience in time, particularly during the last few so rapidly changing centuries, has been astonishing, and nothing but History can reveal it to us.

To compare these different states of society, in the Dark Ages and the Middle Ages, in Tudor and in early Hanoverian times, with each other and with our own society, is profoundly educative in a hundred different ways. It is as an edu-

cation to the mind that History has its only value. Utilitarian and material value it has none. Nor can any hard and fast laws of politics be deduced from a study of the past, nor any prophecies about the future made. The ways of Man are too complex and variable to be reduced to a set of rules that always hold good.

But there is no better training for the mind in sympathy, imagination and understanding than that which is given by the study of History. For wisdom is won not through rules but by experience, and History enlarges our experience of man, and emancipates us from the trammels of our own surroundings. The different ideals aimed at and sometimes attained by our ancestors in the various ages of the past give us new criteria by which to judge of the peculiar merits and the peculiar defects of the civilization of

our own day, much as foreign travel enables one to estimate aright the faults and virtues of British civilization.

There are, of course, dangers in an incomplete or prejudiced study of the past. The Chauvinist feeds his racial passion on the history of the wrongs and glories of his land, and views the

past of all other countries in that light alone. The Historian's danger religious or political zealot

reads with eager joy of the days when his church or party bore absolute sway, forgetting how different from our own was that world in which such predominance was normal. The partisan of the upper, the middle or the working class selects a version of economic and political history that leaves out half the relevant facts and considerations. True History has a hard task to correct these vagaries, and many popular misconceptions, sometimes based on shallow ignorance, sometimes on one-sided learning, are rife to-day in the most various quarters.

The best panacea for this evil is the study of History in its various aspects. Ecclesiastical and political history can be very misleading if studied 'in vacuo,' but fall into their proper places in the scheme of human life if studied together with economic, social, legal and intellectual history. Social history best holds the general scheme together. For the changes in the relation of classes are caused mainly by economic and industrial change, and are in turn the underlying causes of political, ecclesiastical and legal change.

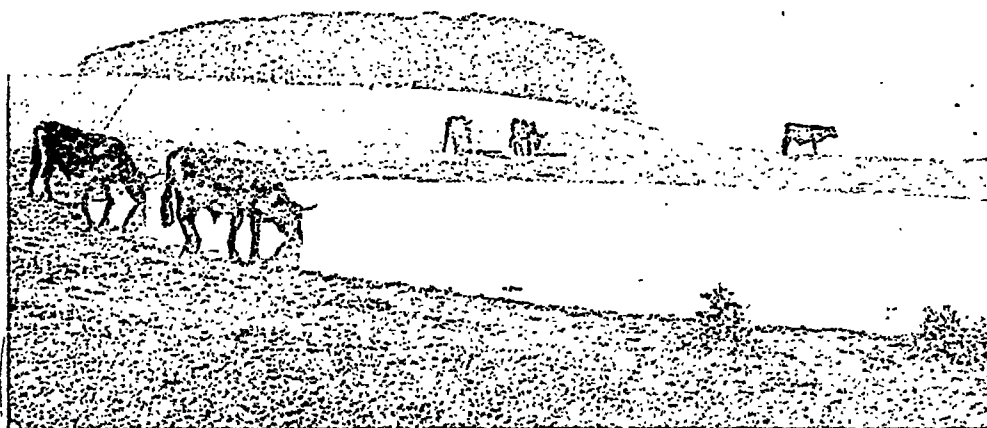
Casual events such as wars, battles, discoveries and great men have their place—hard to define but undoubtedly very great—in these movements of more slowly working general causes. To watch how these various activities of Man cross and recross each other as cause and effect, weaving the warp and woof of the brightly coloured tapestry of History, is the highest education to be won from historical study. In the wisdom that comes of that study lies the true value of history to the statesman, the soldier, the priest, the scholar, the journalist and the citizen.

The evolution of Man in society, in all ages and in all countries—nothing less than that is the subject of History. What each

passing phase of society was like in each time and place, what were the qualities of its individual great men and of its common folk, how it came into being and how it was in its turn transformed into something different, what general causes and what unexpected catastrophes or deliverances wrought each change and gave its peculiar quality to each passing age—those are the problems of History. What could be more interesting to Man than such a study? It is, or should be, if it were written aright, the true humanism. What are gases and black-beetles compared to it? Yet we historians have not been so much on a level with our task as the physical scientists with theirs. For History requires higher qualities of mind for its never-attainable perfection.

It is no wonder that History is to a considerable extent replacing 'classics' as the principal humane study. Like most changes in human affairs, this change is not an unmixed blessing, although it is a necessary transition. The great value of classics, as the principal education of Englishmen from the time of Dean Colet to the time of Dr. Arnold, was that it gave an education in Literature and History together, the literature and history of a great civilization which was very different from our own, but out of which our own has grown. And the same may be said of the study of the Bible, carried on during the same period by even larger classes than those which were brought up on the classics.

Modern History will be hard put to it if it is to give so good an education and so liberal an education as that which our ancestors used to get from the study of the Bible and the classics. History needs the Humanities together. Indeed, without the continuation of those two great studies, modern education and modern History would be most impoverished affairs. Greek, Roman and Hebrew history and literature are important branches of History and Literature, as they should be studied in our age and country. And the study of History and Literature together is necessary to our age, unless the modern world is to sacrifice on the altar of physical science and industrialism



WHERE ANCIENT BRITONS LIVE AGAIN : CISSBURY AND CHANCTONBURY RING

Nothing more stimulates imagination than immediate contact with the relics of the past. When amid the pastoral surroundings of the Sussex Downs we come upon the mighty circumvallations of Cissbury, or see the tree-crowned earth-work of Chanctonbury across the dew-pond, perhaps no less ancient, then we may call up a vision of the Britons who raised these fortifications.

Photos, C. Bex and G. Loader

the cultural inheritance of the past, and the spiritual prospects of the future.

In our age, History is more and more becoming social history. What we moderns chiefly desire to learn from the records of the past is the physical, political, domestic, economic and intellectual conditions under which men and women have lived in the various ages and lands. The danger is that in answering this class of question, History, by becoming too abstract in its generalisations, should cease to be human and should lose the personal and dramatic interest which narrative history and biography can more easily attain. If social history deals only in abstractions and generalisations, it loses its value, which

consists in enabling us to imagine what our forefathers' lives were in truth like.

Now our forefathers' lives were not abstractions, but concrete, full-blooded realities. A well-known history tutor wrote to me of an undergraduate: 'He is singular among my pupils in treating history as though it had really happened.' There lies, then, a danger of teaching history in abstract generalisations. Students may not feel 'that it really happened,' yet the essence of History is its reality—otherwise it is only bad fiction.

This danger of inhuman abstraction is to be corrected by constant reversion to detailed cases and personal instances. That was how the greatest historian of our

century, Maitland, made the life of the Middle Ages alive again to his pupils and readers, although his theme was medieval law, a subject that some would have supposed sufficiently far removed from 'human nature's daily food.'

Yet it is to the pages of Maitland almost as much as to the pages of Chaucer that we turn to get a living and human conception of medieval life as it

Law a vehicle for vivid history was lived, and medieval thought as it was shaped by daily usage in village and town, on the riding track and in the law court, and 'at the very scaffold's foot, I trow.' For Maitland was never content with expounding an abstract rule or principle of law until he had illustrated it by some concrete example taken from some veritable record of his year books or manor rolls, and shown us the passions and follies of real men and women as they worked in and through the quaint laws and rough justice of their day.

When we pass from the realm of social history, and from the history of institutions and conditions of life, to the more old-fashioned narrative history, here at least there should be less danger of losing touch with the reality of the past through dealing over-much in generalisation. Narrative history has every opportunity to be human, dramatic, actual, and it often is so, particularly in the hands of older writers of the so-called 'literary' school, of which Gibbon, Carlyle and Macaulay were the great exemplars.

The business of abusing that school begins to grow stale, for what have we got instead of it? Too often, I fear, in the realm of narrative, tales told in a manner calculated to send the reader to sleep or to make him forswear History for ever. In too many modern historical narratives, the facts, however accurate, leave no sense of reality; they seem never to have taken place except on the printed page. The narrative has acquired the worst quality of generalisation. Dull narratives of historical events are worse than dull generalisations about social history, for a generalisation may have value even if it is dully stated, but a narrative has little or no value unless it conveys a living impression of how the things happened.

It is the special function of narrative history to make us feel the reality of the past as if we were ourselves alive in it, spectators and sufferers in the event; in Carlyle's words, to 'sweep away the illusion of time' and to place us beside our forerunners as one of themselves. Carlyle's intense and vivid sense that the past was as real as the present constituted his great virtue as an historian, which will outlast the rest of his philosophy. Endowed with a tense poetic and emotional nature, he satisfied it intellectually not in reading great works of poetry and fiction, for most of which he had all too little appreciation, but in reading the dusty records of the past, and transfusing them by imaginative sympathy into the living actualities which they once were.

'History, after all,' he writes, 'is the true poetry. And Reality, if rightly interpreted, is greater than Fiction.' In describing the election of Abbot Samson in Past and Present, he writes:

But now, sure enough, at Waltham, on the second Sunday of Quadragesima, which Dryasdust declares to mean the 22nd day of February, year 1182, thirteen St. Edmundsbury monks are, at last, seen processioning towards the Winchester Manor-house; and, in some high Presence-chamber and Hall of State, get access to Henry II in all his glory. What a Hall—not imaginary in the least, but entirely real and indisputable though so extremely dim to us; sunk in the deep distances of Night! The Winchester Manor-house has fled bodily, like a Dream of the old Night; not Dryasdust himself can show a wreck of it. House and people, royal and episcopal, lords and varlets, where are they? Why *there*, I say, seven centuries off; sunk so far in the Night, there they *are*; peep through the blankets of the old Night and thou wilt see! King Henry himself is visibly there—

Carlyle's vision
of the past

That, I take it, is the imperishable, indisputable, wholly uncontroversial and incontrovertible part of Carlyle's poetry and philosophy. All historians or students of History who are to extract any good from their studies, must have in some form or other some touch of that attitude towards the past, that intense yearning to know about it, because it once actually happened long ago. If they have it not, they had better leave history and confine

themselves to reading poetry, fiction and the daily newspaper.

If it is a special function of narrative history to make the past actual and concrete,—the same is true of biography. In biography we are to get the living man, the human creature, given back to us from beyond the grave. Abstraction has no possible place in biography, a man's 'Life' must be particular and human or else be nothing.

The taste of the reading public to-day is much less favourably inclined to narrative history than that of the Victorian age; but one of its favourite forms of serious reading is biography, and it still consents to acquire historical knowledge in that way. Social history and biography are both in demand. They are indeed complements of one another. Social history tells us about the lives of our forerunners in the aggregate, while biography reproduces specimens of individual men and women.

The real treasures of the past, which our age desires to recover for itself by the aid of History, are not the events but the men and women. The

Men and women narrative of events is of
of other days interest mainly for the
sake of the men and
women who—individually or in aggregate
—made the events and were part of them. Social history—like the first volume of Professor Elie Halévy's *English People in the Nineteenth Century*, gives us the conditions of life and the ideals of life of ordinary men and women in past ages. Biography gives us the great characters and minds which those conditions produced at lucky moments, by the chances of birth and accidental circumstance.

Nature makes and breaks her types of civilized man in bewildering profusion, but she never reproduces them. Neither the class nor the individual, once dead, will ever again exist in the world, and only History can save some shadow and memory of them from oblivion. Never again on this mapped globe will voyagers burst into unknown seas, or Francis Drake tread the deck; the world will never again know the Puritan squires as a class, nor Oliver Cromwell as a man; neither the world of eighteenth century culture, nor Dr.

Johnson in particular, will ever again exist except in History.

So long as men can breathe, or eyes can see, So long lives this, and this gives life to thee.

In History they live, and the contemplation of them has its influence, small or great, on the minds of our very different age. We lifelong prisoners of this latest age have other worlds of experience opened to us by social history and by biography. Corbett's Drake and the Tudor Navy, Raleigh's Elizabethan Voyagers, Carlyle's and Firth's Cromwell and Boswell's Johnson make us in imagination freemen of other ages and nobler societies than our own.

It is the modern fashion to write and read History increasingly in the biographic form. Professor Basil Williams writes not a History of England in the Seven Years' War, *Modern taste for*
but a Life of William *biography*
Pitt, Earl of Chatham.

Professor Holland Rose's lives of Napoleon and of the younger Pitt are more popular than a history of those times would be. Even diplomatic history loses much of its dreary official abstraction when Professor C. K. Webster and Major Harold Temperley purvey it to us as portions of biographies of Castlereagh and Canning.

Biography not only brings the human element into prominence, but gives a certain artistic unity, or at lowest a unity of purpose, to the book. The ordinary narrative history of a period is apt to be lacking in unity of design and purpose, to be in fact too like 'time's doting chronicle,' a kind of superior posthumous newspaper, selecting and rejecting events for record in a manner arbitrary or haphazard. But in a biography no one can complain of the omission of events not relative to the life of the man in question.

It is, however, true that a single biography, even if it be of such a man as a Cromwell, a Pitt or a Napoleon, is not only inadequate but positively misleading if taken by itself as the picture of a whole period. But there are many worse ways of studying a period than to read a number of biographies of different contemporaries and rivals, held together by some good study of the social conditions of the country and period that produced them

all. A good biography—and by no means all biographies are good—should enable the modern reader to contemplate a period through the eyes of one of the great men who actually lived in it and wrought upon it. Multiply that process many times, and the reader of several good biographies has had the opportunity to view the same period from a number of different contemporary points of view.

Modern historical research, particularly in the realm of modern history, has unearthed immense masses of facts, sprawling over our libraries like the

Unwieldy mass of debris of a quarry or a discovered facts mine. Consequently the

limitations of the biographic form are welcome to both writer and student. It imposes limitations and prescribes unity and purpose. The biography, in fact, is to History what the sonnet is to poetry. Wordsworth's sonnet on the Sonnet is applicable: 'Nuns fret not at their convent's narrow room.' Yet the biography is more spacious than 'the Sonnet's scanty plot of ground,' and therefore its place in History is greater than the sonnet's place in poetry.

But the functions of History are not confined to discovering and picturing for our benefit past states of society and lives of individual men. History in its fullness is not a series of isolated and disconnected snap-shots of the past; it aspires to be a continuous or 'moving' picture. Its duty is to show how and why one state of society passed into the next by modification or by catastrophe. What were the causes of the rise and fall of the Roman Empire, of feudalism and of medieval catholicism? Why and how did Parliamentary government develop in England, while France, divided by so narrow a strip of sea, went the way of Louis XIV and the Jacobin Revolution?

Such are the problems, infinite in number, on which the ordinary man properly looks to History for guidance. How is the present linked to the past by causation and growth? How and by what mysterious processes of gestation and delivery have our age and society emerged from the womb of the past? And similarly, how and why did each epoch in the past proceed out of the one that came before it?

To answer these immensely difficult but proportionately interesting questions, History is put to its fullest test. It is not enough that she should describe to us isolated episodes, epochs or lives. She must show the workings of cause and effect in human affairs, the relation of 'inevitable tendencies' in social and political growth to the rival element of chance and catastrophe. She must apportion their respective weight in human development to accident and to growth, to war and to peace, to physical and geographic conditions, and to 'great men' and the movements they initiated. She must demonstrate the reaction of economic change and invention on society, politics and religion, and the counter-action of human institutions, ideals and prejudices on the action of the so-called 'economic man' within his own particular sphere.

In dealing with these great problems, which embrace almost everything that is human in their vast sweep and action, much will clearly depend on the ability, the opinion and the outlook of the individual historian. They are not problems that can be solved by anything remotely analogous to a mathematical or scientific formula, nor

There is safety in numbers

by a mere accumulation of facts. There will always be many diverse opinions of these questions, and History can give no complete and few final answers to problems of this kind. Only in the multitude of researchers and interpreters will there be anything approaching safety in the conclusions arrived at.

For we historians are dealing with the elusive, many-sided, incalculable and variable spirit of Man in all his aspects, not with the easily dissected body of a black-beetle, type of the bodies of all other black-beetles. Our knowledge of the thoughts and acts of men in the past is, even at its fullest, fragmentary in the extreme. Yet the more a man knows, the more he has thought and read on one of these problems, the more he has consulted the work and conclusions of other historians approaching the same subject from a different angle of research, opinion and experience, the more likely at least is he to come to conclusions containing part of the truth and relatively

devoid of positive error. More than that cannot reasonably be hoped.

'The judgement of History' is a phrase frequently and lightly used. In some sense, no doubt, all important actions, political and other, stand to be brought some day before that tribunal as the highest human judgement seat. But let us realize that the judgement of History is constantly varying, that successful appeals are constantly being made from the Court of History in one age to the Court of History in the next, from one historian to another, from one school to another. This does not imply that History's judgements are valueless, but that they are manifold, variable and seldom final. Indeed the points at issue are too various and too subtle for any one judgement to cover all the ground.

In this matter it is well for laymen to bear in mind that because two historians often contradict one another, it does not follow that one must be wholly right and another wholly wrong in his point of view. On specific and detailed questions of fact—did Wellington meet Blücher the day before the battle of Waterloo?—there can of course be only one true answer. But to other questions—did France want Napoleon back in 1815?—there can be many true answers. And the further question, whether she was right in wanting him back, or right in not wanting him back, is the merest matter of opinion. 'History' can give no infallible judgement on such a point; it can only suggest the grounds on which a reasonable private opinion can be formed.

Laymen should also beware of supposing that the latest 'judgement' of History is necessarily the right one; it may be

a mere oscillation of the pendulum of opinion, before a juster equilibrium is reached. It

may, it often does, merely reflect a current phase of modern political or religious thought which may be more, but may also be less, just than the political or religious thought of fifty years ago. And often a single historian who takes a new view of a period claims before the public to represent the body of modern historical opinion, whereas he only represents himself.

But with these provisos and warnings, I believe that laymen can get much instruction and food for thought by attempting to follow, not in too credulous nor yet in too wholly sceptical a mood, the modern variations of the 'judgement of History.' The layman should always remember that the same proportion of fools and of wise men is engaged on forming the judgement of History as in forming the judgement of the nation at election time. They cannot all be right, and the fact that they are all called 'historians' by no means gives them all an equal value as guides to historical truth.

Nevertheless, upon the whole, if the layman is not led away by every untried wind of new doctrine, but chooses the most authoritative modern historians as his guide, there is a probability on the average that their views will be nearer to the truth than those of fifty or a hundred years ago, because they are based on a very much greater number of ascertained facts, and because they are, at least in the case of the best historians, the outcome of collating the views and knowledge of a great number of students and writers past and present.

On the other hand the great historians of previous generations, whose works and reputation have survived by their merit, are much better worth reading than inferior works chosen for no reason save their newness. When great intellect or great literary art has been applied to an historical period or subject, it is in the highest degree unlikely that any later work on the same subject will be of equal value, until an equally great man arises.

A perception of this truth is fortunately growing in historical circles and more particularly in the educational world on its historical side. The idea which was too commonly held by pundits and teachers a generation ago, that a modern text book was more valuable than a great history that was 'out of date,' is now perceived to be perverse and uneducational. Modern historians and teachers are more apt to direct the attention of scholars and readers to the great historians of all ages, and to direct them to the contemporary literature and records

of the epoch that they are studying. The close connexion of History and literature is perceived to be of the utmost educational importance.

There is, indeed, a 'history of History,' and to lose touch with the historians of past times is to lose touch with History herself. It is not the custom to neglect the work of the painters, poets and novelists of the past; to do so would make art and literature a mean and miserable sciolism, without breadth, roots or tradition. And so it is with History.

In England History has a particularly noble tradition. She has been rich in great thinkers and writers who chose History as their theme. Yet thirty years ago we were being urged to neglect them as being 'literary historians' and to concentrate solely on modern 'scientific' research after the German model, breaking with our native English traditions. A reaction against this had begun even before the Great War. It is felt to-day that English history, though part of a cosmopolitan study, has a tradition and character of its own, connected not only with science in method of research, but with literature in method of exposition.

Though History must be based on sound scholarship, it is for the use not of scholars only, but of all men and women who have any care at all for the things of the mind. Its function is to keep our

generation in touch with the very different lives of our ancestors. The immense rapidity of social and economic change in our own day makes this more than ever necessary.

Owing to modern inventions, our life is in many of its most important aspects so different from that of our grandfathers that the traditions of our land and many of the best traditions of the world as a whole will be lost in oblivion, except in so far as History and literature can preserve them for us. In our day people are less rooted in the past than of old, less conscious of continuity with their forefathers and with the traditions of their land. The rapidity of invention and economic change, the disappearance of the rural population in England, and the terrible disturbance of the war have

weakened tradition and the sense of connexion with the past.

The study of History and the spread of historical knowledge and of the historical sense will at least do something to make good this deficiency, to restore balance and good sense, and to give people the idea of continuity and evolution in national and human affairs. But this can only be done if **Essential branch** History is popularised **of education** through education and through literature. There will be little help if it becomes a subject studied only by small bands of researchers. It should be an increasingly large part of the national education, in schools, universities and classes, in private reading and in the talk of men.

Modern historical research has indeed accomplished marvels in its discovery and analysis of so many past stages of society, and its restoring to human knowledge of the records of past events, and of men forgotten that were. Whole epochs have been resuscitated; civilizations of which only the name remained, and not even the name, have been recalled to light. The detailed knowledge and understanding of more recent history, medieval and modern, have been not less astonishing. There is nothing that more divides off civilized from savage man than this power of reconstructing the remote and long-forgotten past as it actually was.

Historians have every reason to be proud of these great triumphs. But that just pride should not lead them to forget the other half of their mission, to popularise the results of their discoveries. For without that popularisation, their discoveries are of very little positive use.

To pose this problem is easier than to solve it. It is no easy matter to bring the best and truest results of historical study before the minds of large numbers of people who have neither the time nor the wish to follow the processes by which those results have been reached. There is no royal road to the end in view, but there are a number of ways by which it is being approached. It is the object of History to link the present to the past, not only in the mind of the student but in the minds of his fellow-men.

DISCOVERING THE UNKNOWN PAST

The Aims and Methods of Archaeology, and its Rôle in the Expanding and Enriching of Historical Knowledge

By Sir FLINDERS PETRIE F.R.S. F.B.A.

Edwards Professor of Egyptology, University College, London; Author of *Ten Years' Digging, Social Life in Ancient Egypt, etc.*

THE power of regarding the past, and of understanding the causes which have produced the present form of affairs, is one of the greatest tests of civilization. The savage may not know even his own parents, and he lives but in the exigencies of the day; his outlook is only on the bare needs of immediate existence, and his cares do not exceed the building of the beaver or the storing of the squirrel.

Even those who carry on a considerable system of cultivation and business—like the peasantry of the East—cannot say how old they are. To them the past of their own lives is merely a series of changes and events that have affected them. They refer their stages of life to the wars, or to other public landmarks such as the opening of the Suez Canal.

The record of years as they pass begins with the notched palm-stick in Egypt, with the annual driving of the nail into the doorpost of the temples in Italy, with the knotting of the cord in America. As soon as a system of picture writing is developed, note is made of the principal event of each year. From the First Dynasty onward, in Egypt, there was a record of annual events and of the height of the Nile; of this only fragments are yet known to us.

In our own national history we see the baldest annals of the invading Saxons, not even yearly at first; later, the annual event was named, and gradually the record grew until there was a connected account of the affairs of the kingdom. After that arose interest in other countries, and translations of history from the Latin opened the world to Saxon eyes.

The growth of records and the power of comparison led on to the sense of history, to observing why and how changes come about. This perception of change was first

fully expressed by Polybius in the second century B.C.; living at the very centre of affairs, he felt that it rested on him to record all the rapid stages of the overwhelming reconstruction which raised Rome from a petty Italian state to be the mistress of the civilized world. Since then, for a couple of thousand years, the written record has been taken as the sole means of understanding the past, and Dr. Johnson summed up the position in saying that we could never know more of the ancient Britons than was stated by ancient writers.

Side by side with the written record there grew up some regard for contemporary objects—coins, inscriptions or vases—which might serve as illustrations of the writings. Their value, however, lay in explaining past history rather than in adding to it.

The first expansion from this too narrow view took place in the half century after the Rosetta stone and Persepolis inscriptions came to our knowledge. The past was now no longer to be bounded by classical or Jewish writers; the original documents of an older world opened before us; thousands of years became as yesterday in the presence of the actual words of those ages. This expansion, though purely literary, has yet scarcely taken its place in modern thought. When a University don was asked about the prevailing ignorance of early history, the reply was: 'But we have no one to teach it; our endowments are only for the classics.'

The days are yet within living memory when no one understood the meaning of remains from unrecorded ages. The first wide expansion of our view came in about

The expansion
of History

1860, with the recognition that human abilities and thought had grown up in far distant periods, under different conditions and climates, and yet that Man's works could be identified, classified, and made a part of the general record of our species. This possibility of knowledge has reacted with good effect on our understanding of later works of Man.

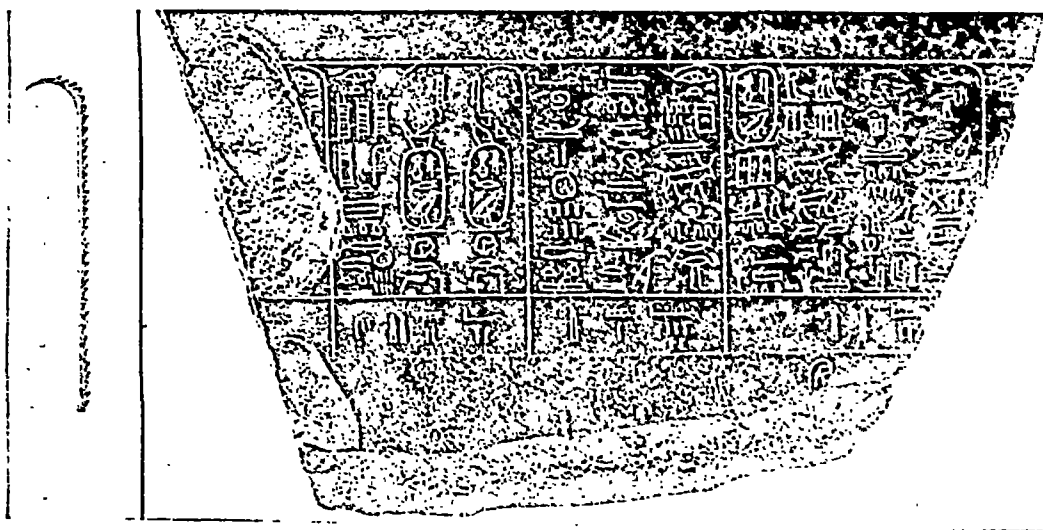
We realize that there are new ways of learning the past; we begin to think in facts and objects rather than solely in writing. The perfection of material treatment in the Parthenon affects our views of the ancient Greek as powerfully as a poem or an oration. The brutal majesty of the Colosseum impresses us, beneath its arches, as much as the record of the Roman plunder of the world. The statue and gem are accepted as revealing what we would never otherwise know of the nature of the men who demanded them, and of those who made them.

This mode of appreciation requires experience and training, just as much as the understanding of writings requires a study of language and its use. The instinct of appreciation of form needs long familiarity and practice. No one can be said to understand a form till he can draw it, or know a colour till he can copy it; the

subtlety of it is hidden from the eyes until it can be reproduced, and an unpractised judgement is little more than ignorant imagination. The modern step of intimately realizing a work of art or a more mechanical triumph, and the power of thus entering into the mind of the past, is as great a step as the establishment of language to bring minds into contact, or of writing to convey thoughts.

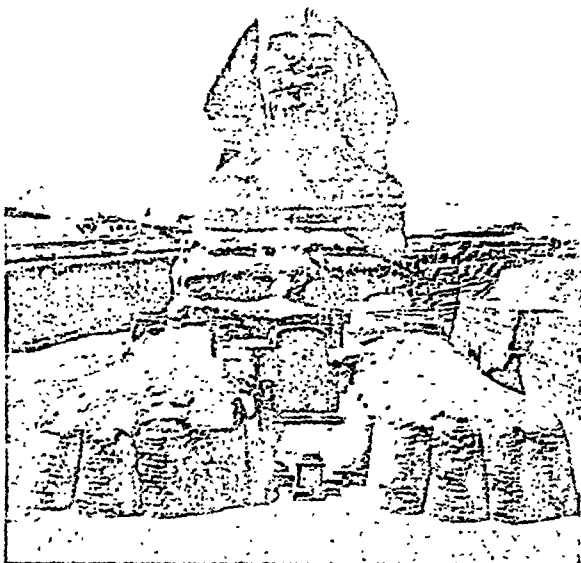
The study of Man's past is an Art; it requires the power of insight, of imagination, of sympathy, of realization, of mental transposition, of identification with the standpoint of a different world. We no longer stand in an age apart, merely wondering at the strangeness or beauty of a work; we have learned to feel it as if we were ourselves listening to the worker, as if we were rejoicing in each living stroke that he added to his work, as if we personally shared in his success and gloried in his greatness.

But though this study is an Art, it must be not merely imaginative; it needs to be based on precise information and must be treated as a Science, in order to interpret all that is found and to read from it the evidence of knowledge and abilities, of the relation of peoples, or the order and development of the stages of Man.



TWO STAGES IN THE GROWTH OF THE CHRONICLER'S ART

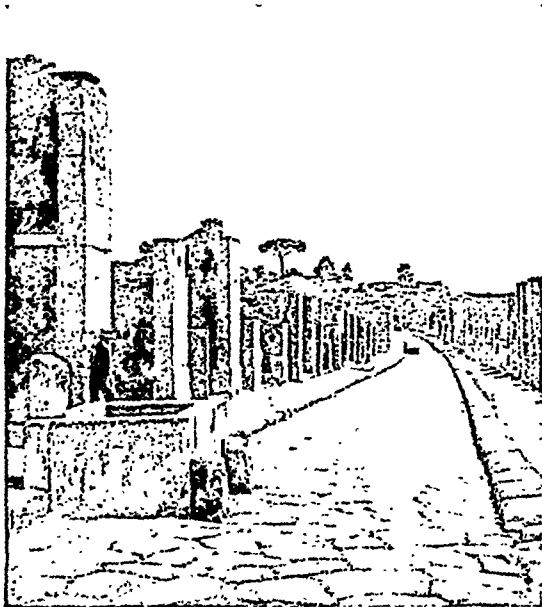
A notched palm-stick (left) was the earliest Egyptian device for recording the passage of years; indeed it became the hieroglyphic symbol for time-reckoning. But so soon as these same hieroglyphs were invented the chronicler had a wider scope, and as early as the Fifth Dynasty we find annals of the preceding reigns engraved in stone. This fragment of the Palermo Stone records the building of ships and the capture of booty under three years of King Sneferu (Third Dynasty).



TRIUMPH OF THE RESTORER'S SKILL : THE SPHINX OF GIZEH

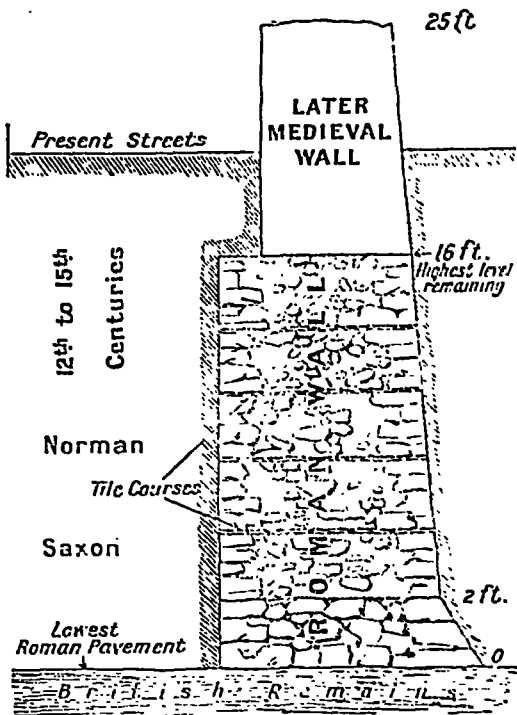
The invention of modern archaeological methods has been one of the most potent agents in the widening and enriching of human knowledge. Above is the Sphinx of Gizeh—as it was (left), crumbling and neglected and silted up with sand in spite of Maspero's partial excavation in 1886 ; and as it is to-day, cleared and restored, yet with no impropriety of treatment to mar its dignity.

Photos by Donald McLeish and The Times



METHODS OLD AND NEW IN THE EXCAVATING OF POMPEII

Time was when the excavators dug recklessly down into the entombed city of Pompeii ; things of priceless interest were discovered, but their relative positions were lost and no more than the lower storeys of the houses could be left standing on the actual site (left). To-day, by removing successive thin horizontal layers of soil, it is possible to preserve the position of discovered objects—for example, by inserting new beams and eaves, to keep in place the original roof-tiles.



HISTORY SELF-WRITTEN BY A TOWN

Up from the level of the oldest Roman pavement, London has been steadily rising with the successive deposits—Saxon, Norman, medieval, modern—of eighteen hundred years, until to-day the average street level has risen twenty feet.

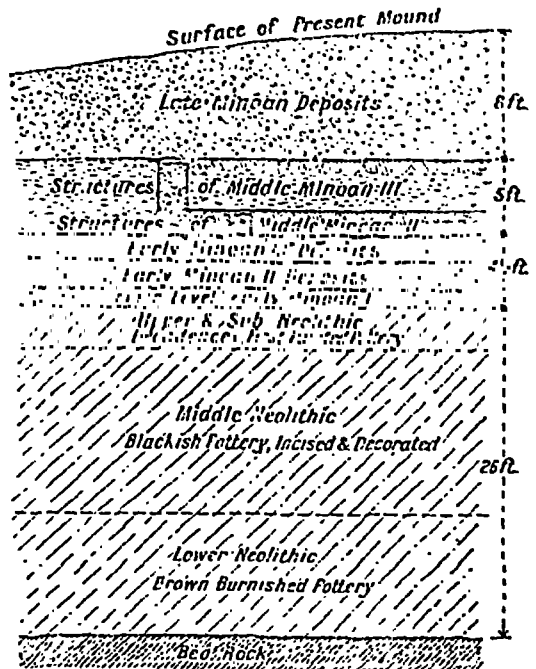
Most extensions of our knowledge are gradual and have been long anticipated, step by step; but five entirely new ideas have come into our ken in the last hundred years—so new that no one had guessed their possibility, so fundamental that it is almost incredible that future dark ages should ever lose sight of them. These are: spectrum analysis, showing the constitution and movement of the stars; microscopic sources of disease, showing the cause of plagues; the world-wide diffusion of electro-magnetic waves, giving communication; the structure of the atom; and the reconstitution of the past history of Man entirely from the evidence of his material remains.

Archaeology takes its place as one of the great expansions of thought which have been quite unforeseen, working a permanent change in the sense of possibilities, like the changes of earlier ages in communication overseas, the smelting of metals or the production of steel.

In the study of Man's nature we must always proceed from the known to the un-

known. Recorded history serves to show the method of its changes, and these can be traced back in outline to remote ages. The type of all known civilizations is, first, an invasion of an energetic people and a slow mixture of race with the earlier inhabitants of the land; after some centuries the united race blossoms in successive periods of architecture, sculpture, painting, literature, mechanics and, finally, wealth. Decay then sets in, which is cut short, sooner or later, by a new people entering the country. The whole cycle occupies about fifteen hundred years, but was slower in action in earlier times. Not all of this sequence of activities could be expected in a barbaric state, but the general type, less specialised, is to be looked for in all ages.

We should now consider the different kinds of evidence that we have, for lack of written record. The most direct and decisive standards of age are the actual positions, in an excavated settlement, of one kind of work over another. In digging down through the mound of London there



BELOW THE PALACE OF MINOS IN CRETE

Excavation reveals the amazing fact that the very mound on which the Lords of Cnossus built their palaces for fifteen hundred years is itself composed of the debris from human settlements, to a depth of 26 feet below the lowest palace. The terms 'Early Minoan I', etc., apply to distinct periods in the palace-building era.

are found traces of the Great Fire; below these, Tudor and Plantagenet things, Norman wattle-and-daub houses, perhaps a Saxon foundation, Roman pavements twenty feet down and, still lower, British remains. This is typical of town sites, and mounds may increase up to eighty feet or more in height, entirely formed of layers of ruined houses, in countries where mud-brick building is usual.

This continuous accumulation, in known historic times, shows how we are to understand similar accumulations which extend into earlier ages, such as twenty-six feet of settlements beneath the oldest palace of Cnossus, a hundred feet of mounds in Turkistan before the Roman age, and at Susa fifty-four feet before 4500 B.C. In the same way the relative order of the prehistoric Egyptian periods

River Drift Types



Chellean



Acheulean



Mousterian
(also among Cave types)

Cave Man Types



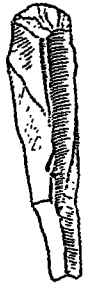
Aurignacian



Solutrean

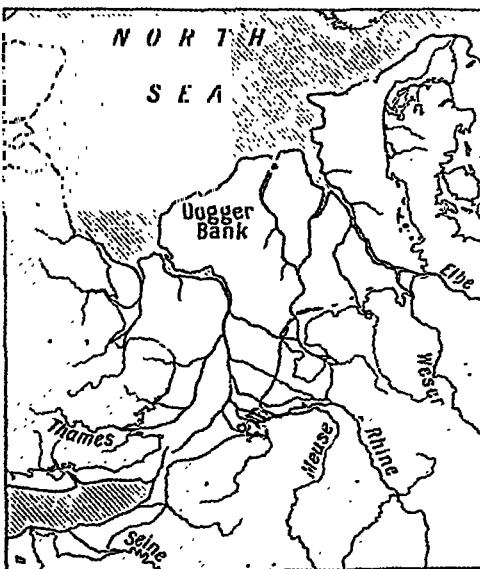


Magdalenian



FLINT TOOLS THAT DISTINGUISH STONE-AGE CULTURES

Flint implements of typical workmanship from the six chief phases of palaeolithic culture are drawn above; they are obviously quite distinct. The Chellean is the oldest, the Magdalenian the latest.



WHEN THE DOGGER BANK WAS DRY LAND

Geological changes as well as human handiwork give evidence to the archaeologist. Thus the Dogger bank was forested land before 3000 B.C.
Clement Reid's 'Submerged Forests,' Camb. Un. Press.

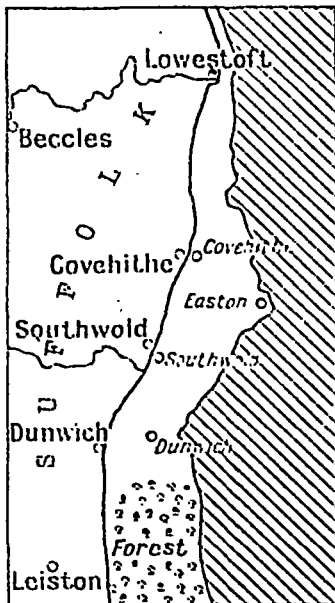
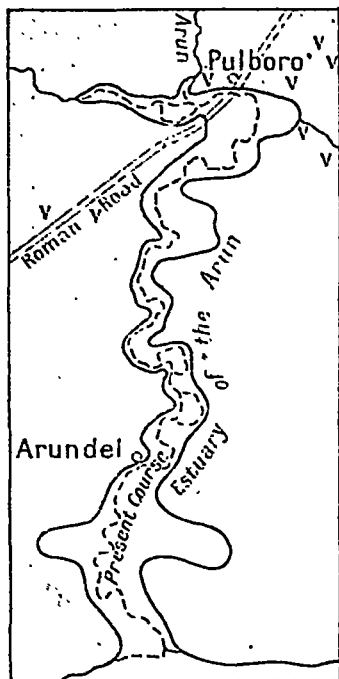
is absolutely proved by finding them all in one settlement, superimposed one above the other. Such dating is the more satisfactory as it confirms the order obtained by mere comparisons of the products themselves. To elucidate yet earlier ages, the same kind of observation is applied also to stratified beds of sands and gravels, each of which contains a different set of forms of flint implements. These, and the periods to which they belong, are named from the principal places in western Europe where they have been found, so we speak of them as follows:

	CAVE PERIOD	
	Peake	Keith
Magdalenian ..	6500	10000 B.C.
Solutrean ..	9500	13000 "
Aurignacian ..	11000	15000 "
Mousterian ..	13000	20000 "

RIVER DRIFT PERIOD

Acheulean ..	40000 B.C.
Chellean ..	80-120,000 "

The recent estimate of date by Peake is drawn from all available facts, but that of



ESTUARY SILTING AND COASTAL EROSION

The silted valley of the Arun, shown white, was once a navigable estuary up to Pulborough, as suggested by the Roman villas (marked V) that cluster there. On the east coast of England the opposite process has eaten away land, also shown white, where once stood the ancient sites of modern villages.

Such changes enable us to gauge the passage of time.

Sir Arthur Keith will show that the time may be longer rather than shorter. These periods are distinguished not only by the different kinds of flint work, but also by the various changes which we next consider.

Besides observing the piling of settlements one over the other, we read back to remote times by noting the changes that have occurred in the condition of a country. The most obvious are the raised shore-lines which can be seen around the coasts. These are brought into connexion with human history by the shell-heaps of shore-dwellers at what was formerly the seaside. The reverse of this process is shown by the submerged forests round the coasts of Great Britain. Deep cuttings for docks and other works have proved that there was a land surface about sixty or eighty feet below the present sea until about 3000 B.C.; the Dogger Bank was dry land, covered with peat and forest, where the reindeer, mammoth and woolly rhinoceros wandered.

A former elevation of the land is proved by the 'deeps' or old river beds at the

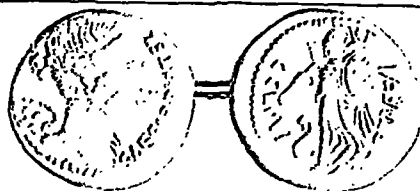
bottom of the Channel and in the North Sea; still greater submergence is seen on the North American shore, where the line of every great river has a continuation in a deep valley of the sea-floor five hundred feet below water level. Lesser changes, with reversal, took place after the third century at Pozzuoli, where land has sunk at least twenty-three feet and been raised again; and at Alexandria, where the coast has sunk about forty feet and been raised again eighteen feet since the Roman age.

The result of recent sinking of the land has been that long estuaries have been formed by the sea extending up the coast valleys; the mouth of the Thames, the Blackwater, Southampton water, Plymouth and Brest still show this. The lesser valleys have become choked

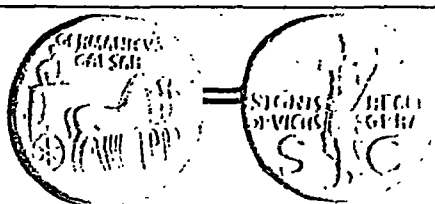
with silt, and thus the long flats at Richborough, Rye, Pevensey, Lewes, Arundel and elsewhere represent valleys which were formerly harbours.

Various places round the coast of Great Britain, partly defended by banking, have gradually disappeared; such was the area lost in Cardigan Bay in about A.D. 450. There is a long history of the gradual submergence of Holland, shown now by the line of coast dunes marking the old shore outside the Zuyder Zee; while for forty miles inland from the Hague the safety of the country entirely depends on embankments. Lakes formed by submergence have been gradually silted up; the successive annual deposits, due to floods of melting snows, have now been traced out, and these give the best indication of the lapse of time.

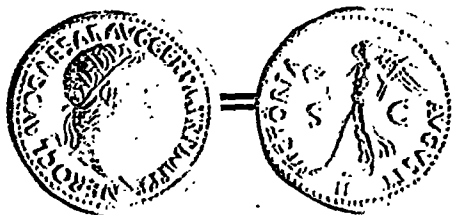
Besides the filling up of valleys, the cutting down of rivers also reveals much of early ages. Thus the Thames valley has gravels, with skeletons and implements embedded, left by the river at levels from a hundred feet higher down to the present. In Suffolk and in Hampshire there



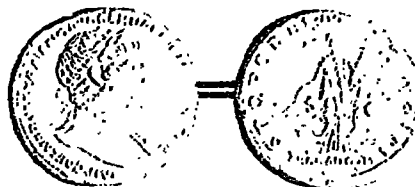
Julius 46 B.C.



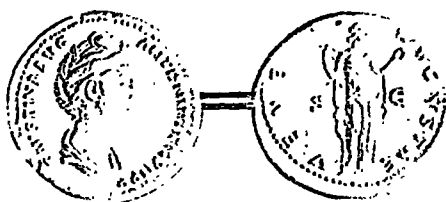
Germanicus A.D. 17



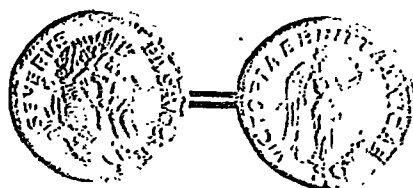
Nero A.D. 68



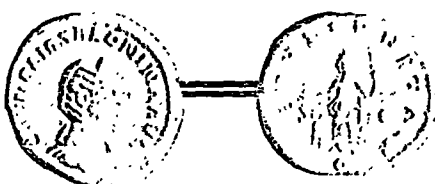
Trajan A.D. 105



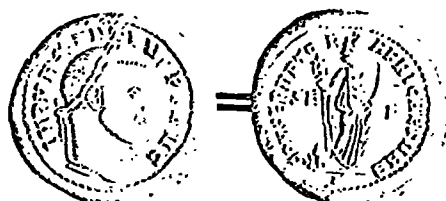
Faustina A.D. 140



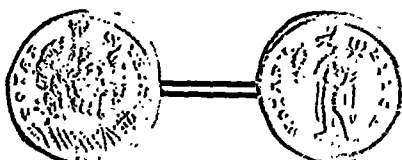
Severus A.D. 210



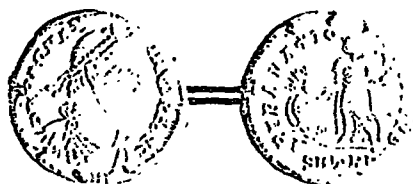
Salonina A.D. 260



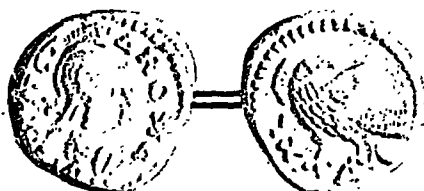
Maxentius A.D. 297



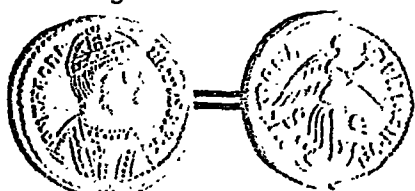
Julian A.D. 362



Magnus Maximus A.D. 388



Ostrogothic A.D. 500



Theodahad A.D. 535

CONTINUOUS CHANGE OF STYLE ILLUSTRATED BY ROMAN COINS

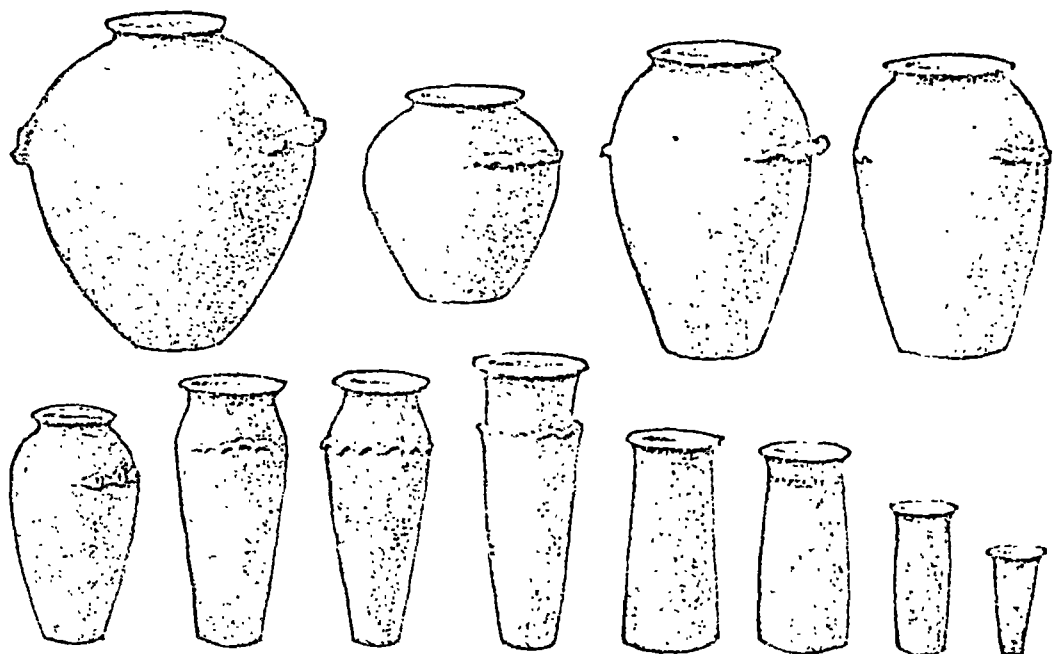
The same principle which archaeologists apply to palaeolithic flints holds good through the ages. Thus Roman coins may be dated to within fifty years by their style alone, quite apart from the inscription, as this degenerating series plainly shows; running across the page, it extends, at roughly fifty-year intervals, from a coin minted for Julius Caesar in 46 B.C. by Clovius the praefect (top left, obverse and reverse) to one of Theodahad, king of the Ostrogoths, A.D. 535 (bottom right).

occur river deposits, with implements, now left high and dry owing to another valley having cut back and so tapped the older stream. Elsewhere rivers have worn out caves in their sides, as at Mas d'Azil, in France, where, since Magdalenian man, the river has cut down seventeen feet, and at Krapina, in Croatia, where the river has cut eighty feet of sandstone, probably since the Mousterian age.

A converse action is seen in the Nile, which dries up owing to running twelve hundred miles without a tributary. The

be slower on limestone cliffs, yet in Malta there are tracks, leading down to the cliff-edge of estuaries and continued on the opposite side, which were apparently made before the present conditions appeared. The traditions of continuity of land across present arms of the sea are therefore credible, and some idea may be obtained of the length of time involved in the change.

There are also the climatic changes, which are of much value for relative dating as they serve to link together different



3,000 YEARS OF CHANGE : THE HISTORY OF AN ART FORM

Arguing from variations in style of assignable date, the archaeologist can classify the undated ages of prehistory. Pottery is the most useful index, and from the progressive alterations in its form a series of 'sequence-dates' (see opposite page) may be constructed for the peoples who made it. The sequence above illustrates the degeneration in Egypt through 3,000 years of a globular jar into a little conical pot of ceremonial use only. Note the variations of the original ledge-handle.

bed, therefore, rises all over Egypt between four and five-and-a-half inches in each century.

An entirely different action, which is sometimes confused with changes of level, is the attack on cliff-coast by wave action. Wherever a coast is of soft or soluble material, such as sand, clay or chalk, it is steadily in course of being cut away, and this may remove a mile of land in four centuries, as at Cromer and Dunwich. The islands which Ptolemy records between the North Foreland and Belgium have been entirely washed away. The action would

places in contemporary periods. The level of the snow line, and the height at which different trees can grow, mark out the past temperatures wherever they can be traced. Closely connected with climate are the various animals and plants belonging to hot or cold, wet or dry conditions. The animals are often of species now extinct, so that a scale of periods can be formed from the grouping that is found. This is complicated by man exterminating useful or noxious species. The lion was common in pre-classical Greece, the hippopotamus in the Nile Delta till the Roman

age, the wolf and bear in England till the Saxons, and the crocodile in Egypt till a century ago.

After looking at the ways in which the history of Man is linked to natural changes, we now turn to see how much is revealed by the work of man himself. Changes among us go on in dress, furniture, handwriting, gardening and every form of activity. The date of a book of the last century may be guessed, from its print and binding, within an average of three years.

Such continual variation of taste is not a modern product. If we refer to a continuous dated series, such as the coinage of Rome, the differences every fifty years are obvious, and every twenty years can be identified. In Egypt the periods, when there is enough material known, can be separated, reign by reign, according to the style.

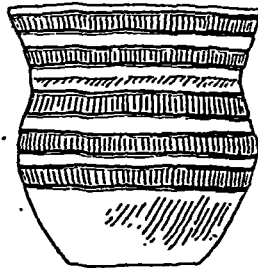
When we look farther back, the habit of change is still seen; there is a fashion which distinguishes each early period, and the transformations are continuous. One of the longest histories of a form of art begins about 8000 B.C. in Egypt, when a globular pot with ledge-handles was made. This was narrowed till it became a cylinder by 6000 B.C.; the cylinder shrank to a little conical pot at 5000. Copied in alabaster at 4000, it became splayed top and bottom and had a narrow waist by 3000, lastly appearing in rough form for ceremonies at 1200 B.C. Such a continuous chain of variation, by almost imperceptible degrees, serves to divide a long period by its stages.

[While immaterial to the author's arguments, it should be pointed out that the dating of Egyptian history which Sir Flinders Petrie uses follows in the main the statements recorded by the Egyptians themselves, whereas other writers prefer to adopt a later scale of dating. Readers may arrive at an approximation to the shorter system (which for various editorial reasons is adopted in the body of this work—see Chronicle I) by subtracting from the Egyptian dates given in this chapter an average of about 1,800 years from all dates preceding 1580 B.C.—EDITOR.]

Thus the material from a long stretch of prehistoric time can be reduced to a regular continuity, so that each form is a

link between others. When this is accomplished—as has been done for a thousand groups of graves—the whole row can be cut up into stages in a numbered sequence, one after another. Thus a 'sequence date' is reached by which every stage is distinguished. The hundreds of varieties of pottery can then each have its limits of age, such as sequence-date 35-43, or 60-64, as truly as we can date a full-skirted coat to A.D. 1690-1750.

The habit of thought of early races was on regular lines. Particular forms were favoured, not only for special uses, but as a matter of taste. Certain stock types having once been adopted, only small variations were made on these, while the type itself lasted beneath the changes. Hence each of the chief ages of the flint-work had its distinctive tradition, like the differences between German and Italian objects of our own age. The immensely long periods left time for the spread of an idea, and it was only very gradually that Man emerged from the fixed stage of his forerunners and became accustomed to change, to grow mentally, to benefit by the experience of others.



Holland



Wiltshire



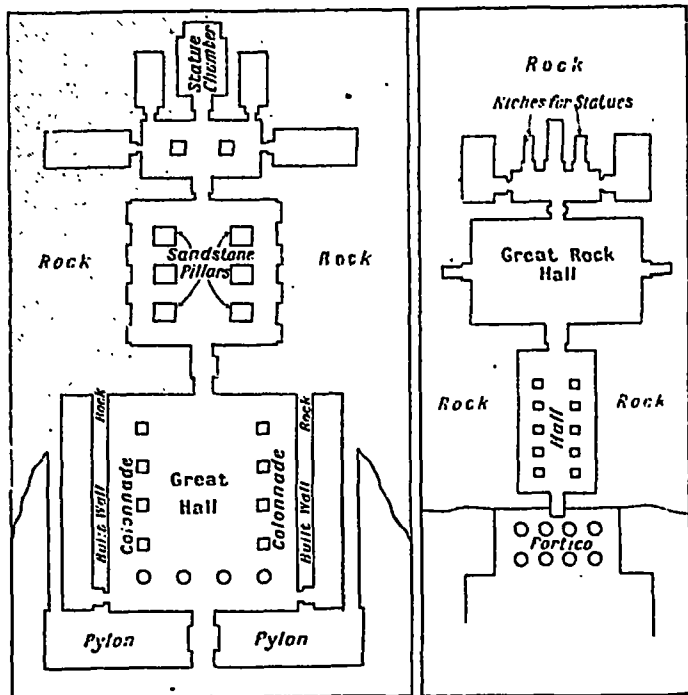
Thuringia



Wiltshire

FROM WILTSHIRE AND THE RHINE

The resemblance between bronze-age beakers found in England and continental forms from the Rhine-lands shows whence the Britons of that period must have come.



EVIDENCE FROM TOMB-ARCHITECTURE

An argument for the source of various Egyptian ruling families may be drawn from the structure of their tombs. Note the similarity between the rock-cut Nubian temple at Gerf Hussein (left) and the Tenth Dynasty tomb at Qau in Upper Egypt.

Perhaps a thousand years of Chellean man equalled a lifetime of the lake dwellers, or a few months to-day, in the proportionate increase of ideas.

Yet we must see that the nature of Man alters very slowly; his changes are in the extent of knowledge, the spread of thought and the utilising of nature. But the attitude of mind, the sense of right and propriety, the admiration of truth and accuracy, were the same in Egypt six thousand years ago as among us now. Not only is this true of historic times, but the grand Chellean flint-picks of pre-history were worked all over with flaking for the sake of uniformity, in place of keeping the natural round butt which was best for the hand. Utility gave place to artistic beauty even in this early period.

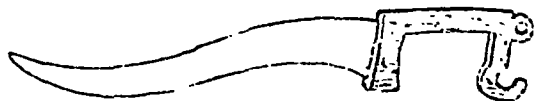
As life became more full of ideas, so the diversity of thought increased. In the earliest ages almost the same form is found to have been made over thousands of square miles. Later began the differences of work between countries; then the parts of a country varied; in medieval towns the cities had their own styles;

and in modern times individuals seek 'self-expression.' In this growth of diversity each country acquired a distinctive style, which is a means of tracing movements of culture or of peoples.

In early Egypt, pottery, both in design and colour, is closely akin to the modern Algerian. The pottery of the Bronze age in England is equally found on the Rhine, from which the makers appear to have come. Similarly, in historic times resemblances are of value. The great tombs of the Ninth and Tenth Dynasties in Egypt are unlike any earlier examples there, but are on the plan of temples in Nubia; the royal tombs of the Eleventh Dynasty are wide courtyards with chambers in the rock around, and so are the present dwellings of the southern

Tunisians. Each of these instances indicates the origin of a ruling family of immigrants.

The distinctive styles of different countries are, then, the labels of their influence, either through objects brought by trade, or through imported ideas, or through immigration of race. At the



CHARACTERISTIC METAL-WORK

This knife-blade with its flamboyant curve is as characteristic of Etruscan work in the sixth and seventh centuries B.C. as Tudor Gothic would be of sixteenth-century England.

present day there are similar examples. Each country had and has its own styles; there is the flamboyant outline of Italic work in the Etruscan age, similar to Hungarian and Persian; there is the curved interlacing belonging to Gothic art, which came into classical mosaics and Justinian's capitals, and began from wicker screens in nomad tents as among the Kirghiz.



STONEWORK THAT BETRAYS THE NATIONALITY OF THE MASONS !

Historic styles of ornament illustrate the significance that must be attached to variations of style in prehistoric finds. Take these examples : the curved bands interlaced in the capitals on the left (from S. Mark's, Venice, and the crypt of San Clemente, Rome) are undeniably Gothic and derived from the wicker screen-work of nomads; while the carving of the ninth century ciborium on the right, in S. Apollinare in Classe, Ravenna, is Lombard and owes its sharp broken bends to rush-work.

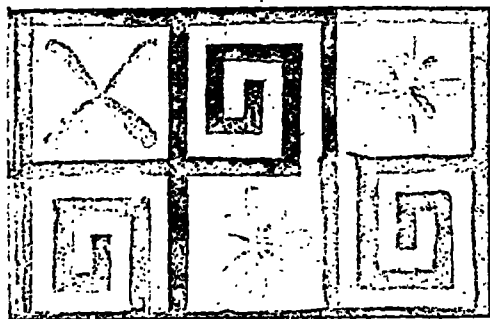
The angular interlacing comes from the Lombards, copied thence in England. The spiral pattern may have started from tree branches, as carved in Malta; it was probably European, as it lasted on to Roman times in Ireland, but died out in Egypt about 1300 B.C. It was turned into a square fret, or key pattern, which appears full-blown in Egypt of the Tenth Dynasty and as the familiar border-decoration of Greece more than two thousand years later.

Beside specific designs such as these, there is a general style which clings to each land, such as Indian, or Chinese, or African, depending on the sense of form which prevails. This will revive centuries after it has been suppressed, like the late Celtic reappearing under Louis XV, or

the cave-man sprays on fourteenth century architecture.

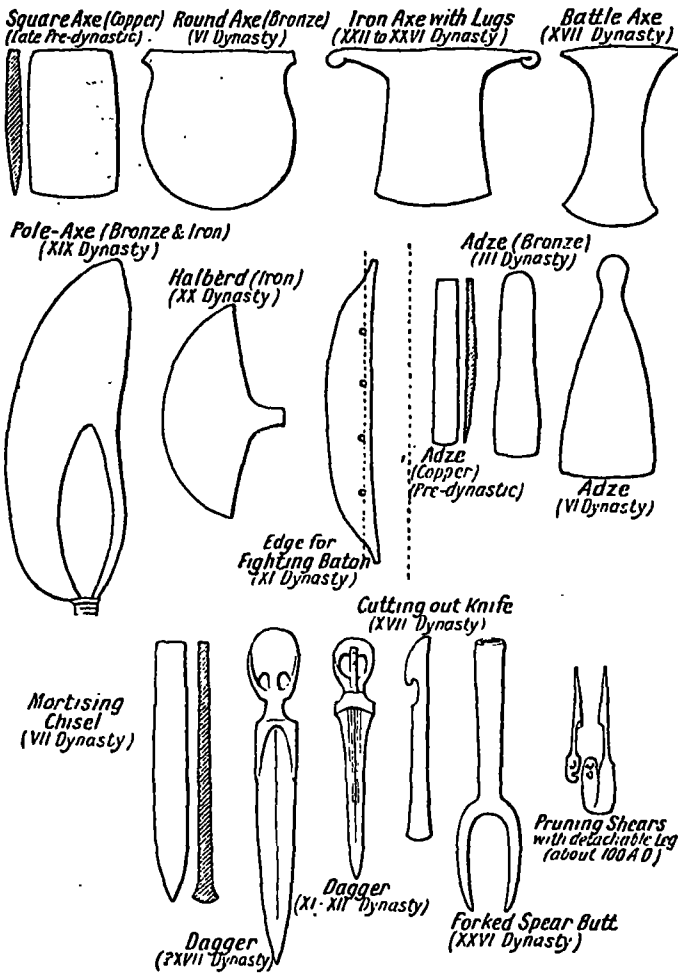
This persistence of taste extends to an astonishing conservatism in national forms. The Egyptians had ten or a dozen forms of tools which were unknown elsewhere; on the other hand there were a dozen forms in other lands around them which were better, yet which were never copied. Not a single hafted hammer, or flanged chisel, was made in Egypt until the Greeks brought them. Such resistance to new types prevents our supposing that arts and ideas were easily spread from country to country.

A great help in early history is given by the various portraits of races. Happily the Egyptian had a taste for observing foreigners, and at the beginning of re-



FAMILIAR PATTERNS FROM A TENTH DYNASTY EGYPTIAN TOMB

The motif of the spiral and palmetto was used as early as the Tenth Dynasty in Egypt, and also its later development the fret. Both occur together on a tomb ceiling at Qau. The spiral probably originated in Europe, and was taken to Egypt; its growth there was imitated by Mycenaeans, and then died out in Egypt but flourished in the west till Christian times. Once such facts are established, the decoration of a find goes far towards fixing its date.



STYLES OF MANUFACTURE PECULIAR TO EGYPT

That distinct styles of craftsmanship are not mere matters of caprice, but real symptoms of racial character, clung to with almost passionate conservatism, is amply proved by this group of tools and weapons, all which exhibit forms found in pre-dynastic, dynastic or Roman Egypt and nowhere else.

corded history there are more than half a dozen different races shown. All through the history the various races are marked out, until, finally, there were modelled heads of all the races from Spain to India. In the Greek and Roman period the coinage of outlying provinces preserves authentic and dated portraits, besides other information about local conditions and so on.

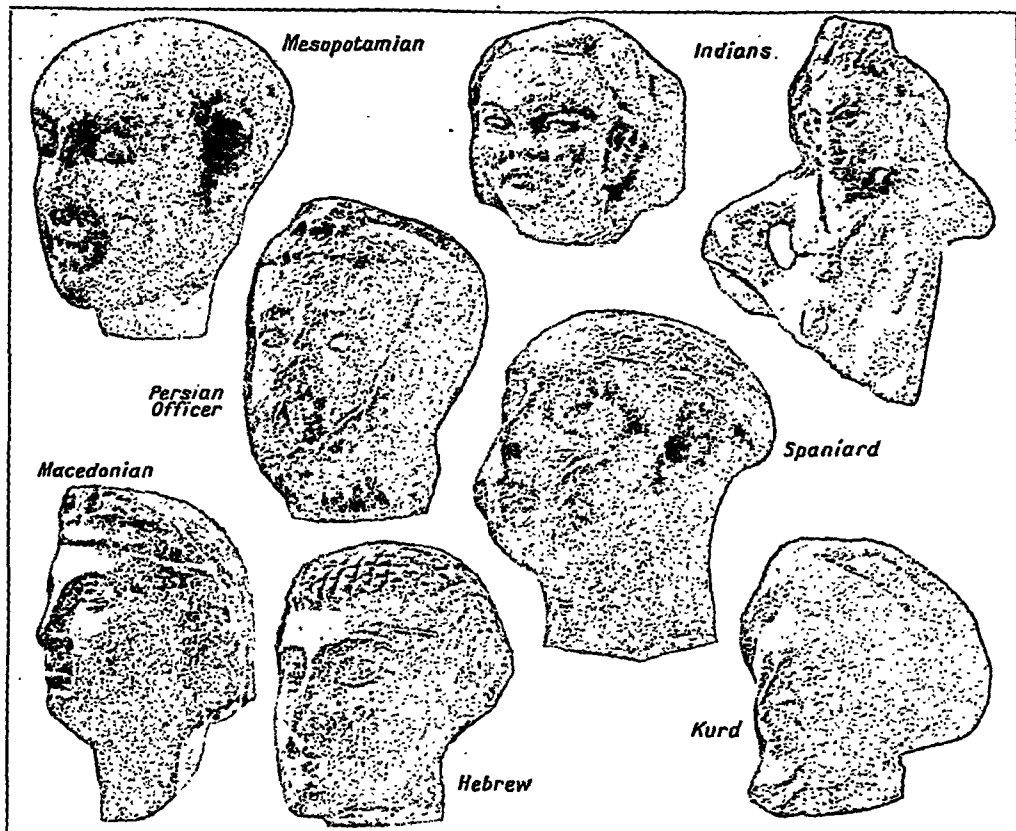
When we find standards of weight the same in very different countries, there is evidence of trade or race connexion. This links China, India and Etruria, and gives a glimpse of a central Asian culture. So with units of measurement: the commonest foot of medieval England was that of the east Rhine lands, of Silbury hill, also of our chain, furlong and old mile; and the same is found in many lands, back to early times in Egypt.

The very fragmentary view that we have, as yet, leaves difficulties in settling how much cultural similarity was due to development in each country, how much due to



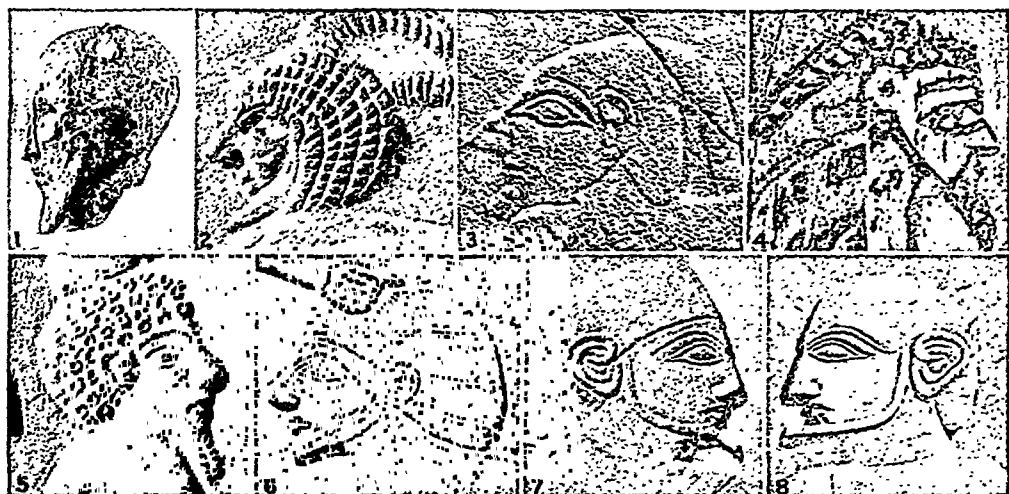
THE RANGE OF COINAGE: FROM BRITAIN TO AFGHANISTAN

Coinage has already been cited to prove variations in style. But its wide range in Greek and Roman times creates for it a unique value, whether as providing authentic contemporary portraits or giving a clue to local conditions. Reading from left to right we have here a British horse, a Spanish horseman, a palm-tree on a Jewish coin of A.D. 68, a portrait of the Sauromates who was king of the Cimmerian Bosphorus in A.D. 120, and a Bactrian coin showing a Tatar of Afghanistan.



AIDS TO ARCHAEOLOGY FROM AN ANCIENT EGYPTIAN STUDIO

As an example of the persistence of national traits—in this instance the Egyptian bent for portraiture—it is interesting to compare the penetrating touch of these clay heads with the specimens below, earlier by several thousand years. The former were found in the town rubbish of the fifth century B.C. at Memphis; it is thought that they were votive offerings at a festival.



RACES THAT MOULDED THE UNWRITTEN HISTORY OF EARLIEST EGYPT

The efforts of the Egyptians towards accurate portraiture are of immense help to the archaeologist in enabling him to trace race movements. These markedly different heads are very ancient Egyptian carvings: 1. Predynastic Egyptian; 2. Arabian; 3. Tributary of invaders; 4. Syrian; 5. Invader (from the Taurus?); 6. Egyptian chief; 7. Dynastic conqueror; 8. Dynastic general.

Babylonia (Early)	
Hittite	
Egyptian (Early)	
Mediterranean (Early)	
Creta	
Mexico	
Easter Island	

SEVEN UNRELATED SCRIPTS

Though attempts have been made to find a common origin for several of them, the seven systems of writing of which examples are given above may still be regarded as independent.

trade and borrowing and how much to movement of peoples. Some clear examples of re-invention or independence may be listed here :

In Egypt the earliest native ships and the invaders' ships were of different forms, and must have been independently invented.

A paddle-wheel, to drive a ship, is figured in A.D. 527 on Roman carving. This cannot have started the use of it in 1789 in England.

The power loom, weaving five or six webs day and night, was in use in Danzig, and

destroyed by trade jealousy before 1660. It was slowly re-invented in 1785 by Cartwright, as recorded in detail.

Silver and bronze pens were used, rarely by Romans; these are not likely to have originated modern steel pens.

The hydrometer was re-invented in 1600; only later did Synesius' description of it in the fifth century become understood.

Block print stamps, with the name of : Ptolemy, were used to mark duty-paid papyri; these can hardly have started Chinese block-printing much later.

Squared papyrus for plans, of 1400 B.C. in Egypt, was found, after engineers had used squared paper in modern times.

Seven independent systems of writing have been separately invented, in Babylonia, Asia Minor, Egypt, the Mediterranean, Crete, Mexico and Easter Island.

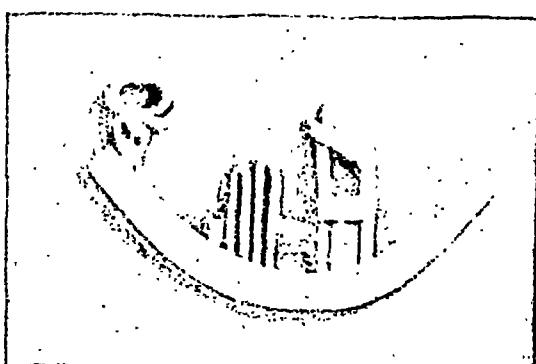
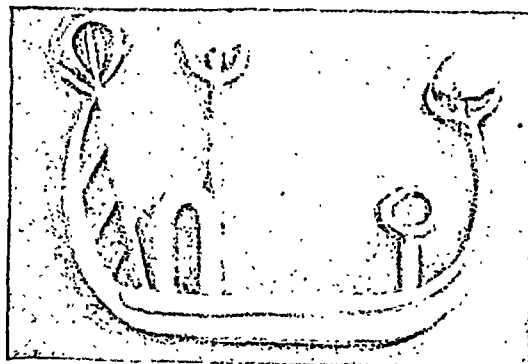
The use of a testing plane, or ' facing plate, in working planes true, was known in Egypt in the Fourth Dynasty, and re-invented in the nineteenth century.

Mirrors of plane, concave and convex forms were invented in America, before the European invasion.

Cork soles for shoes were used by the Romans, and re-invented recently.

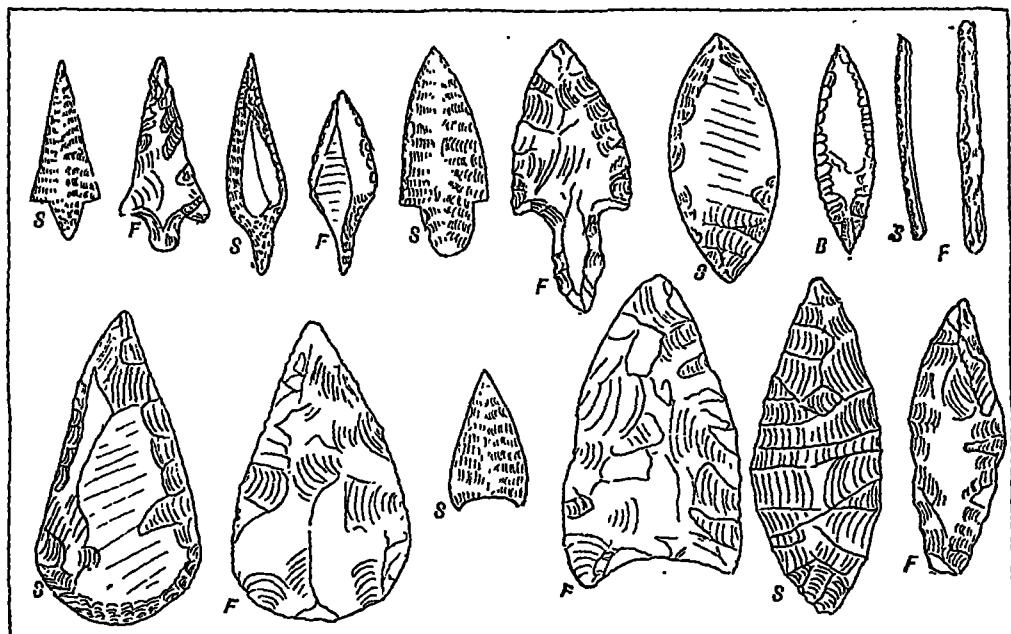
Knitted wool socks, with separate great toes, were used by the Romans; knitted stockings were re-invented in the sixteenth century, separate toes in the nineteenth.

It is familiarly known how often various persons, at the same time but quite independently of each other, devise the same invention. It is therefore to be expected that similar ideas will also occur at long intervals. The above cases are examples of such recurrence. Where there is obvious mechanical utility in any idea, it is likely to be revived again as often as it is forgotten. But where an



EARLY TYPES OF SHIPS AS SEEN BY AN EGYPTIAN IVORY CARVER

As examples of independent invention, the ships of the pre-dynastic Egyptians and of contemporary invaders of Egypt have been cited in the text. The evidence for this statement is the Gebel el-Arak knife-handle (see page 39), one side of which depicts a battle-scene. The opponents possess the obviously different ships shown above, one being of the Egyptian felucca type (right), perhaps derived from reed-bundles, and the other apparently a dug-out of folk from a forested land.



WORKED FLINTS FROM EUROPE AND THE NILE VALLEY COMPARED

Those flint instruments whose styles provide the 'sequence-dating' for the Ages of Stone come mostly from European ground, and careful comparison is necessary to bring finds from other parts of the world into relation with them. The selected examples above show the connexion that must exist between the so-called Solutrean phase in Europe (marked S) and certain Egyptian flints found at Badari (B) and in the Fayum (F). The question is, were they contemporary?

artistic form or design occurs, there is no constant stimulus to reproduce the same idea. Hence artistic resemblances are good evidence of descent.

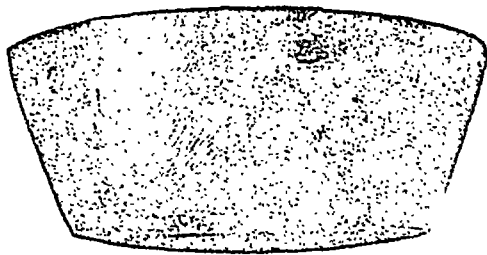
We have now glanced over the alphabet and grammar of material history, and it remains to sketch what is the view of the past which is recovered by these means. In place of thinking that nothing was possible but what we happen to know, we now look on our discoveries as being only limitations of the possibilities of history. What else was going on around, or before, what we know, no one can define till we recover much more of the past.

The most completely known example of the rise of a civilization is in Egypt. The earlier palaeolithic works of Chellean and Acheulean flint are found lying on the surface, and both are found in different levels of the granitic gravel, which belongs to the period of the great rainfall that scoured the eastern mountains. The earliest stage of cave-man work appears with Mousterian flints buried in the limestone gravels, and, later, exposed on the surface settlements.

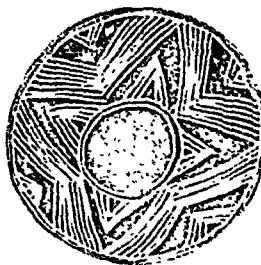
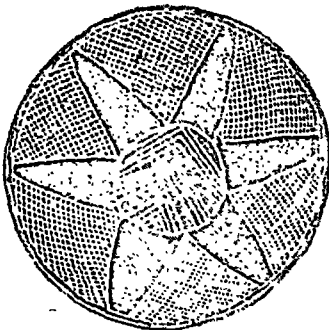
The beginning of a continuous view of man in one place is seen in flint work of Aurignacian type—perhaps 15000 B.C.—which underlie others of Solutrean type at Badari in Upper Egypt. The full view of civilization begins with the Badarian Age, which, according to Nile deposits, was somewhere between 15000 and 10000 B.C. It was a long period, as one village site was found divided into two by a layer of hard concreted rubble, of slow formation.

The people were skilled in delicate work in flint; they executed the finest hand-made pottery, thinner, harder and more polished than any of later and historic times. They were carving ivory, and modelling pottery figures, in a natural and capable manner. They glazed stone beads, spun thread and wove, cultivated corn and stored it, carved ivory combs and used germicide eye-paint. They were thus much above the present races whom we call barbarous.

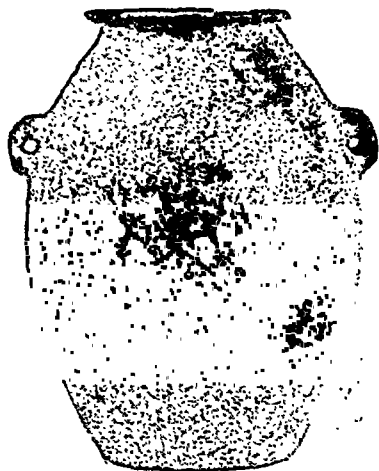
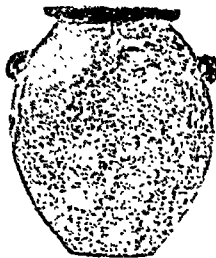
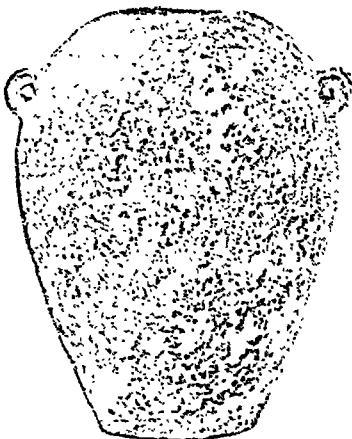
The restoration of this people to our knowledge depends entirely on the layers of their remains which underlie the other civilizations, and the levels at which their



The earliest glimpse of anything like civilization which Egypt affords to the archaeologist is the Badarian, so called from remains first found at Badari near Assiut in Upper Egypt. Though hand-wrought, the pottery is harder and thinner than any ever afterwards made in the land.



Next to the Badarians upon the Egyptian stage came the Amratians. They took over many of the arts of their predecessors, but introduced the novelty of painting their pottery. The designs are copies of basketware, and it is significant that similar work is done to-day in the Algerian hills.

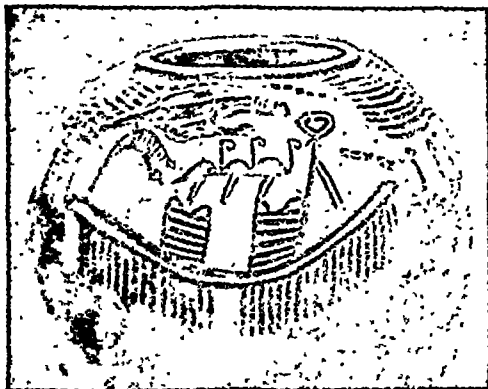


It is their pottery that chiefly distinguishes the races which followed each other in the dim pre-history of Egyptian civilization, and these examples of the three earliest show that there is no mistaking one for another. The Gerzeans, who followed the Amratians, wrought in the hardest stone, and produced entirely by hand vessels of such perfect shape as the porphyry vases above.

HOW PREHISTORIC PEOPLES ARE DISTINGUISHED BY THEIR POTTERY

works are found, in relation to the Nile. It is clear that they were decadent in Egypt—their earliest remains there are the best. As such flint work is known in Palestine with shells from Suez, we must look on them as emigrants from the north. The flint work is closely like the European

Solutrean work, perhaps of the same age, and that is known to have come west from the north side of the Black Sea; so we are led naturally to look to the Caucasus as a possible centre of this civilization. Now, that region has been noted as being very like the Land of the Dead, or



WHAT AN ANCIENT VASE CAN TELL

From the fact that Egyptian vases were painted with figure subjects during the Gerzean civilization, we learn that those responsible for it built large ships, some with two cabins.

paradise, as described by the Egyptians: very fertile, yet with lakes of fire and high mountains. Such an account agrees with the Caucasus valley, and nearly all the names of places in the Egyptian mythology are found in that country in their true connexion. Thus the test of traditional names comes in to confirm the result from the material remains.

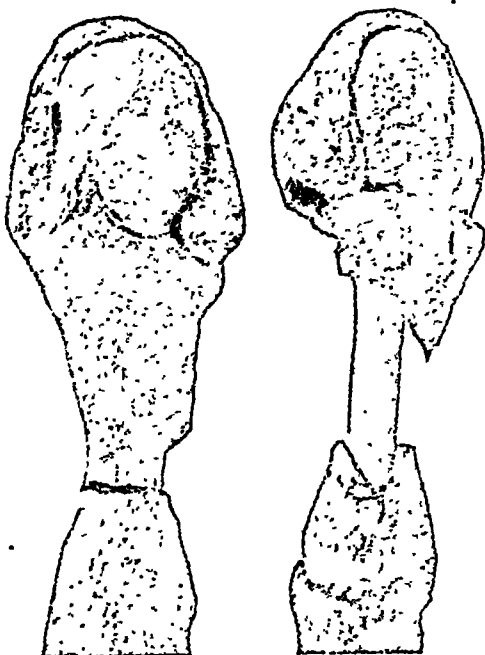
The Badarian civilization faded in Egypt, and the land was overrun by invaders; as they are best known at el-Amrah, they are termed Amratian. They seem to have come from the west, as their



IVORY HANDLE OF A FLINT KNIFE

The famous Gebel el-Arak knife-handle, superbly carved probably with flint tools, is a striking proof of the high level which civilization and taste had reached in predynastic Egypt.

decoration of pottery with basket pattern in white or red, in the same designs, survives in the mountains of Algeria. The Amratians took over the arts of pottery, ivory work, carving of figures, glazing, agriculture, weaving and eye-paint from the earlier folk. But they had fresh ideas, such as the painting of designs on pottery, new forms of flint work on a larger scale, the use of rowing boats or galleys and a small use of copper; also the personal customs of shaving the head and wearing a wig and sandals. The



FIGURES MODELLED 10,000 YEARS AGO

It was the Amratians, apparently, who introduced to Egypt the custom of shaving the head and wearing a wig. These paste figures have the wigs modelled on separately.

succession of these people after the Badarian is proved by the layers of their settlement, and the immediate connexion is seen by the carrying on of many ideas. Perhaps about 10000 to 8000 B.C. may be their period.

From the east there came a third civilization, overlying the Amratian; this, being found at Gerzeh, is termed Gerzean. This was more advanced; large shipping came into use and trade extended to Europe. Copper was usual for small tools; gold and silver appear.

Flint working was developed more highly than in any other age. Vases of the hardest stones were finely wrought. Pottery was commonly painted, often with figure subjects. Emery, lazuli and, rarely, glass were brought from Asia. There was some northern connexion, as a figure of an elk was carved on slate. Games with pieces came into fashion. The use of linear signs, or property marks and badges, increased. The country was united, apparently in peaceful intercourse, as the same types of pottery and decoration are found over all Egypt and even as far afield as Nubia (the Sudan) in the distant south.



SCULPTOR'S STUDY IN LIMESTONE

To show the genius of the early dynastic Egyptians for portraiture it is only necessary to reproduce this limestone head—probably a sculptor's trial study—which carries the stamp of truth in its every line. It is of King Narmer.

This civilization lasted from about 8000 to 6000 B.C. and then collapsed suddenly. All the finer products disappear, the pottery and flint work become poor, trouble increased with invasions by the 'dynastic' race, and also from the south and from Asia.

The fourth civilization was that which grew into the united kingdom of the First Dynasty. This movement extended over several centuries, like our Saxon or Danish-Norman conquest of England. There was

a great confusion of peoples, eight different races being figured as fighting in this period. The dominant power was possibly a trading people from Elam, who came down the Persian gulf, round Arabia and up the Red Sea; one branch would have pushed into Upper Egypt, another gone north to Suez and allied itself with the North Arabians to conquer the Delta. Thus two kingdoms were formed, which were united by Menes, the traditional and possibly the actual founder of the First Dynasty.

These people brought many of the ideas of Mesopotamian culture: the use of panelled wooden houses, high numeration to millions, the beginning of hieroglyphic writing, the use of cylinder seals, an abundance of copper for tools, fine portraiture in ivory, pottery of large size and fine material, and glazing for tiles and faience. Writing soon became usual, and precise annals were recorded of the principal events of each year, the height of the inundation and the day of accession and death of each king. Foreign pottery was often imported, doubtless with much else of less bulk and more value, both from Syria and from Crete. A wide organization of the country was formed, the seals of over a hundred officials being known, connected with royal property. After the middle of the First Dynasty, decay is evident and it was not long delayed.

The fifth civilization was due to an invasion from the south; a conqueror, of Sudani features, founded the Third Dynasty. Entirely new ideas entered the country: we see immense monuments of stone, fluted columns with foliage capitals and fine sculpture of figures. Varicoloured glazing was freely used. The notion of models and pictures of offerings, serving for the dead instead of the actual objects, was greatly adopted. This new movement culminated in the vast schemes of Khufu, the builder of the most accurate and the largest structure known, the reorganizer of Egypt, the subduer of the priesthood. From his portrait he appears as one of the most dominating personalities in all history. With him, the lines of Egyptian growth were established, and the course of events is henceforth the subject of the written record.

Before History Began

EARTH AND ITS INHABITANTS IN THE PREHISTORIC ERA

SHORT SURVEY OF THIS DIVISION

1. THE BIRTH OF THE WORLD

Showing how Astronomy and Physics can provide
a Rational Explanation of the Origin of the Earth
J. H. Jeans, D.Sc., LL.D., F.R.S.

2. THE MAKING OF THE EARTH

Geology traces through Aeons of Time the Changes
that made Earth fit for Animal and Human Life
Prof. J. W. Gregory, D.Sc., F.R.S.

3. LIFE ON EARTH BEFORE MAN

A Short Study of the Fossil Remains disclosing the
Evolution of Animal Forms preceding Human Life
Prof. D. M. S. Watson, F.R.S.

4. THE EVOLUTION OF MAN

How Anthropology and Anatomy combine to prove
Man's Slow Ascent from Lower Forms of Life
Prof. Sir Arthur Keith, M.D., D.Sc., LL.D., F.R.S.

5. THE PRIMITIVE COMMUNITY AND THE ORIGINS OF RACES

With Inferences as to the Manners and Customs of
Prehistoric Man from the Study of Modern 'Primitives'
Prof. H. J. Fleure, D.Sc.

6. PRIMITIVE CRAFTS IN PEACE AND WAR

The Material Evidence that Survives to shed Light on
the Art Adroitness and Daily Life of Prehistoric Man
R. R. Marett, D.Sc.

WHILE the aim and scope of this division of our work will be gathered at a glance from its title and the subjects of the chapters it comprises, it may be mentioned that, in common with the succeeding section, it is offered as introductory to our History proper. The chief characteristic of this work is its continuous narration of world-history, presented in a sequence of Chronicles, each accompanied by a group of Studies or interpretative chapters wherein authoritative writers seek to recapture something of the spirit of the times under review, to examine and expound the principles that underlay the events narrated. But in this introductory division we are mainly concerned with an effort to acquire a knowledge of the stages whereby mankind was evolved upon the Earth and the sort of life that men led in the dim immensity of time preceding the dawn of history; and for this we study primitive peoples still surviving whose manners and customs offer clues to those of prehistoric man.

Short Survey

INTRODUCTORY TO OUR GROUP OF STUDIES IN PREHISTORY

HISTORY, unqualified by any adjective, is the history of Man, of his actions and his thoughts. In the days, not so far distant, when one single act of creation was held to have brought man and the Universe simultaneously into existence much as we see them now, it was possible to write an apparently reasonable history of mankind that took no account of the other 'histories,' of natural history or astronomy or geology, or of that still more recent science called anthropology.

To-day our whole outlook on these matters is profoundly altered. We now know that for millions of millions of years this universe of matter, a mere handful of whose brighter bodies star the sky at night, was evolving before our tiny world was born—an event of yesterday in stellar history; that our Sun is just a small star among the stars; that even compared with the Earth's brief story the life of Man upon it is like the last few seconds of a long day; and that only during about a fiftieth part of his existence has Man been leaving conscious records.

Scope of our First Division

WITH this knowledge it would be indefensible to embark upon a Universal History that ignored the universe—to narrate man's intricate reactions to his kin and his environment without making some attempt to describe the vast stage upon which he has entered as such a newcomer. And then there is Man himself. Can it be reasonable to pick up the story of this most baffling creature at the moment when he began to make records, without first inquiring what he is?

This work is, therefore, no less rigidly a history of mankind because its first section is devoted to matters that do not find a place in most histories.

Now in the body of our History, as already explained, the ordered sequence of events is given in 'Chronicles' and their

interpretation in annexed chapters. Here, at this primordial stage, no such division is possible; but since the matters discussed in the following six chapters are of some complexity, it will be advantageous to start by defining the ground covered and presenting in a clear outline the answers given by modern science to the problems that affect us. And that is the object of the present Introductory Survey.

Mysterious Beginning of Things

THIS opening section, then, contemplates no exhaustive resumé of the various sciences involved; they are called in to answer certain definite questions only. What is the Universe, its age and extent? What is the Earth and how did it come into existence? How did life arise and spread? What is Man and through what changes did he evolve? Lastly, how was Man behaving during the centuries before he stands out in the clear light of his own records? Not all these questions can be answered with the certainty to which we are accustomed in the affairs of every-day life.

No limit, for instance, can be set to the age of the Universe. It is impossible to imagine a distribution of matter and energy that might not have had an antecedent stage of development. But such marvellous strides have been made by astronomy that to-day it is possible to suggest a round number of years during which the oldest star *visible to us* can have existed as a star. The figure is 200 million million; and on this scale our Sun would be between 7 and 8 million million years old.

Before the longer period, it seems, every star that we know must have been part of a nebula. Thousands of these clouds of tenuous gas may still be observed scattered through the heavens, at all stages of what appears to be a slow but progressive and universal development; and in Chapter I Dr. J. H. Jeans

shows how the patient comparison of one with another leads to the conclusion that they are shrinking, rotating and condensing, and that a colony of stars is the ultimate product of each.

Are planets, such as our Earth, born from stars in the same manner? So it was once thought, but physical facts do not support the view. According to the theory expounded in the second half of Dr. Jeans' chapter a star acquires a family of planets, not slowly and inevitably, but by what is probably a rare and sudden accident—the near approach of another heavenly body that by its gravitational pull drags the planets out of the body of their parent. Such a catastrophe once happened to our Sun.

How long ago this event took place it is impossible to say with exactitude; but as radioactivity demands at least 1,500 million years since the solidification of the Earth's crust, and as there is reason to think that this process did not take long (on an astronomical time-scale), perhaps an estimate of 2,000 million years would not be far wrong.

Life's First Emergence on Earth

UAST figures like these convey little by themselves; let it be said then that, compared with the age of the Sun given above, the age of the Earth is as the length of the last brick in the last house in a street more than half a mile long. Even to realize this, it is necessary to think consciously of a familiar street and then gaze at a brick wall.

From the moment of the appearance of life on the Earth we can trace its evolution with some approach to certainty; how it appeared is still a matter for conjecture. But a surprising amount of most interesting facts bearing on the question has been accumulated by chemist and biologist, and some of this material is laid before us in Chapter 2, where Professor J. W. Gregory traces the history of the Earth through the great epochs of its development.

These divisions of geological time are grouped into four eras, for which varying names have found acceptance. As considerable confusion often results, the two schemes of nomenclature most commonly

in use may be set side by side, with the meaning of the second in a third column:

Era of :			
Archæan	· · Palæozoic · ·	Primeval Life	
	(or Eozoic)		
Primary	· · Palæozoic	· · Ancient	"
Secondary	· · Mesozoic	· · Middle	"
Tertiary	} Cainozoic	· · Recent	"
Quaternary			

Epochs of Geological History

THE first set of terms applies more specially to the types of rock, the second to the living species that characterise each Era; but they are interchangeable, and indeed there is little valid distinction between them because of the number of rocks that owe their origin to organic agencies. These agencies have usually been lowly forms, of types that still provide by far the greatest quantity of living matter in the world to-day, though they were the first of all to evolve. Hence they are inseparable from the subject matter of Chapter 2; but with the emergence of backboneed animals in the Palæozoic Era the story of that progressive minority, the higher forms of life, is taken up separately in Chapter 3 by Professor D. M. S. Watson.

In the meantime, however, while species were multiplying, growing, flourishing and dying out, or else evolving into more complex varieties, the great processes of earth-building were still going on. The crust was shrinking and folding, mountains were being upraised and planed down again by water and wind and ice, continents rising and sinking. And if stress is laid in Chapter 2 on the formation of those minerals that were eventually to prove of use to mankind, this is the function of the work and should not be held to involve the question of a design in nature, which is outside our scope.

The Upward Urge of Life

IN rocks of the Palæozoic Era the earliest fossils are encountered. First they are of low, shell-fish forms that had adopted a stony armour to protect them against carnivorous foes, then of horny-coated crustacea, the trilobites. Next on the upward ladder came the fish, with a backbone and internal skeleton. It was one group of these which, forced from the

shrinking lakes by a long epoch of drought, developed lungs and limbs and so evolved into the amphibian inhabitants of the great Coal Forests.

Momentous Changes of Living Forms

THE same climatic change that blotted out the rank vegetation of these forests probably stimulated certain amphibia to take the momentous step of severing their dependence on water and becoming completely terrestrial. At any rate there were reptiles on the Earth before the close of the Era of Ancient Life, though their great age of ascendancy was the Era of Middle Life when monsters of all shapes and sizes were undisputed masters of every element. In the same way mammalian forms had actually evolved at the beginning of this middle era, though they were of little account until the reptiles vanished with the dawn of the Era of Recent Life.

The world now began to assume a vaguely familiar appearance. The outlines of the present continents took shape, though there were many land-bridges where to-day is sea. Indeed the degree of resemblance to modern conditions has provided the names for the periods into which this Era is divided, so that we speak of the Eocene, Oligocene, Miocene and Pliocene periods, implying the 'dawn' of modern conditions, little modern, not very modern and more modern; while the Pleistocene, meaning most modern, is regarded by anthropologists as the first period of a new Era called the Quaternary, whose second period, the Holocene or entirely modern, includes to-day.

Ancestors of the Human Race

QUITE early in the Era of Recent Life there emerged a group of little creatures in which we take a pardonably exclusive interest, for they were probably the ancestors of some hitherto undiscovered ape that in its turn gave rise to the modern anthropoids and to Man himself. They are known as the Tarsioids—their living representatives are the tarsiers—and the evidence for their distinction, and for the descent of Man, is set forth in Chapter 4 by Sir Arthur Keith.

The intermediate ape has so far yielded no certainly identified fossils. Not so primitive man. We now have remains—crania, thighbones, teeth—dating back to the late Pliocene and early Pleistocene, and belonging to creatures that walked erect and had a brain capacity far larger than that of any known ape. Whether mankind to-day, admitted to form a single species (*Homo sapiens*), is directly descended from these early types is highly doubtful.

Human Species now Extinct

WITH a later group the question of species, however, becomes more acute. Between these earliest bones and the first men who dwelt in caves, and whose remains are therefore preserved in fair numbers, there stretch aeons of time represented by strata that yield flint implements of primitive manufacture. Their makers dwelt on the drifts beside river margins. But when we come to the cave men we have to deal with creatures whose humanity is undoubted and whose intelligence must have been of a very high order. It is nevertheless stated that they were a collateral, now extinct, offshoot from the human stem, constituting a separate species called *Homo neanderthalensis*, from the Neander Valley near Düsseldorf where they were first found.

But before taking up the story of *Homo sapiens* it were well to glance back at two separate questions hitherto ignored because of the difficulty of giving anything like positive answers. What time-relation do our four geological eras bear to the 1,500 million years postulated for the age of the solid Earth, and how long ago did Man evolve? Secondly, can any reason be given for his intellectual climb out of the ruck of the other mammals?

Arguing from the thickness of strata geologists are inclined to say that the Primeval Era must have lasted four times as long as the other three put together, the Palaeozoic half as long again as the other two, and the Mesozoic more than three times as long as the Cainozoic. If we allow 30 million years for the Cainozoic, this just accounts for our 1,500 million; but it must be admitted that some scientists, more especially the

Before History Began

zoologists, are only prepared to give the Cainozoic two million—which is the sort of discrepancy that must be expected in the present state of our knowledge.

Sir Arthur Keith adopts the lower figure; so that as the oldest discovered human remains are referred to late Pliocene times, Man is on this basis *at least* 300,000 years old. Moreover, as this only takes us back a short way into the Cainozoic, the estimate would serve almost as well on the longer reckoning.

Now the Earth towards the end of Pliocene times underwent what is known as a glacial epoch. The ice-caps spread outwards from the poles, the mountain ranges were laden with snow and great glaciers ground their way down the valleys to cover the plains with ice. Much of Europe then experienced Arctic conditions and Pliocene man vanished.

When Mankind Lived in Caves

THE Ice Age, however, was not a homogeneous phenomenon. Several times throughout the Pleistocene the ice advanced and retreated, with quite clement conditions in the intervals. The first long warm interval was the great age of the drift-dwellers, as we can tell from their flint implements; but during a subsequent glaciation we find a group spreading into Europe along the borders of the ice and apparently acclimatised to cold conditions—the Neanderthals already mentioned. They were presumably drift-dwellers who had learnt to combat the rigours of the cold by taking to caves and making fire. May it not be that the Ice Age, with its stimulus to invention and adaptation, is responsible for the great intellectual advance of which the Neanderthals are the earliest example?

Of course, these changes of climatic environment must have had suitable material to work upon. No other mammal was thereby stimulated to a progress comparable with that of Man, who for ages had used stone weapons and could probably already speak. In Chapter 4 the subject is fully discussed.

It was in a warmer period, after the worst of the Glacial Epoch was spent, that modern men first came upon the

European stage and so enter our ken. They probably spread in successive waves from North Africa and south-western Asia, districts that are now largely desert but received sufficient rain to make them habitable grasslands when the ice was over Europe. Neanderthal man retreated northward before them, with the colder climate to which he was accustomed; or perhaps was exterminated.

First Advent of Modern Men

EUROPE, though no longer Arctic, was still fairly cold steppe-land, with the rigours of a continental climate unmodified by extensive forests; and these new men were cave-dwellers like their predecessors. But they had great intellectual potentialities, and towards the end of their period there was a tremendous outburst of art. Bows and arrows appear, and probably also clothing and artificial dwellings of wood or skins.

Professor H. J. Fleure, in Chapter 5, gives a picture of the life that must have been led by these early food-gatherers. Society was probably organized on family lines, for man seems to have inherited the idea of the family-society from his ancestors the apes, and the older theory of a primitive horde is now no longer held.

The Invention of Agriculture

THE phrase food-gatherers has just been used, and this brings us to the next event in human evolution. Somewhere near the Euphrates and the Nile the discovery was made that food could be produced as well as gathered; in other words, cultivation of crops began. It used to be thought that this was preceded by a pastoral and nomadic stage, but more probably pastoralism was in most cases a secondary accompaniment of agriculture.

Agriculture brought in its train a whole host of other inventions. The arts of weaving and of pottery were elaborated. Stones were ground instead of chipped, and so flint was no longer used exclusively. This interest in other minerals led to the discovery of copper and of its alloy bronze. The necessity of tending the crops made for more permanent settlements. Villages and finally cities arose, and the advantage

Short Survey

of organized work—irrigation, especially—led to the establishment of kingship.

Religion we may also regard as having begun at this stage. Of course, it is largely a question of nomenclature, for there is plenty of evidence for supernatural beliefs among the food-gatherers. But the four elements that seem to make up religion—magic, fear, ethics and a learned priesthood—had not before now been fused.

How Religion first Came to Be

THE primitive hunters believed that Nature could be influenced by imitation—that prey, for instance, could be ensured by representing a successful hunt in make-believe. Hence magic. Misfortune was apt to be connected with anything unusual—thunder, a strange rock—and the weapon of magic used to avert it. But causation implies an idea of will and personality. Hence gods. At this stage magicians and witch-doctors might arise, but scarcely priests. There is reason to think that divinity was only attributed to the more regular manifestations of Nature, such as heavenly bodies, with the introduction of agriculture, and that the gods did not receive human form without the analogy of the kingship or of deified ancestral heroes. Finally, religion was born when the tribal god was made guardian and sponsor of the tribal ethics, which are still completely separable from religion in certain backward races, and no less strict on that account.

The date to which we must assign the invention of agriculture has been one of the most vexed questions among anthropologists. It was once the fashion to throw it back into a remote past; but while modern research has greatly extended the antiquity of Man, it tends to bring agriculture down to comparatively recent times, say 7,000-10,000 years ago.

Meanwhile modern man, still in the food-gathering stage, had occupied the rest of the habitable globe, including the New World. Among his communities there slowly spread the 'invention-complex' of the food-producers, in ever widening circles from the original centres in south-western Asia and Egypt, favoured in her possession of the annually flooded Nile;

but communications were bad and Man conservative, and at first there penetrated little more than scraps and shreds.

The spread of the forests, for instance, had caused a period of misfortune to overtake the old homeland of the European hunter-artists. Their cultural descendants still eked out a miserable life on the shores of the North Sea with a diet of shell-fish, while agricultural folk, whether newcomers or not, made way in the clearer zones. But the equipment of these latter did not include the knowledge of metal, only the improved treatment of stone; so that we speak of a Neolithic or New Stone Age, though the term should be used with great reserve except when applied to Europe.

This word, Neolithic, is used in contradistinction to the previous Palaeolithic or Old Stone Age; both are archaeological terms referring to methods of flint-working. As we have seen, a more significant division for historical purposes is into drift-dwellers and cave-dwellers (both food-gathering), and settlement-dwellers (food-producing); yet a proper insight into the successive styles of stone-working is of immense importance, for it is almost entirely on these more durable specimens of his handiwork that we base our knowledge of pre-record man. Thus the subject is given due prominence in the last chapter of the section where Dr. R. R. Marett outlines what we know of primitive arts and crafts.

Beginning of Recorded History

IT was in Egypt and Mesopotamia less than 6,000 years ago that Man first began to leave conscious records, and 'prehistory' came to an end. But there are areas to-day where in all essentials the native inhabitants are still pre-record men. Moreover, in the remotest of these areas they are still food-gatherers, even if possessing stray elements of a higher culture; and indeed so primitive that they may be used to illustrate the prehistory of more advanced races. So that although the stream of our history proper now takes its rise, there are yet backward races of to-day that find their place in this opening section.

THE BIRTH OF THE WORLD

Showing how Astronomy and Physics can Provide
a Rational Explanation of the Origin of the Earth

By J. H. JEANS D.Sc. LL.D. F.R.S.

Secretary of the Royal Society; Author of Problems of Cosmogony and Stellar Dynamics

LEGENDS as to the origin of the world figure largely in the vast body of tradition which is handed down from generation to generation among primitive races. These legends universally postulate a living creator—often a bird, an animal or an old man—and a supply of raw material out of which the creator builds the earth. Often enough the ocean and the heavens are supposed already to be in existence, and the creative act consists merely in making the dry land. Clearly all such legends are formed out of mere ‘picture-thoughts,’ the reveries of the primitive mind first confronted with the workings of nature.

The intense interest which the Greeks felt in nature resulted in a richer, more serious and, it need hardly be added, more artistic mythology. Uranus, the most ancient of all the gods, founded a dynasty in which son succeeded father through three generations, each of which took its share in the creation of the world, until it was peopled with gods, goddesses and the lesser divinities who presided over all natural phenomena.

Six centuries before Christ we find Thales of Miletus discarding this mythology as being too anthropomorphic, and from then on to the time of Empedocles (450 B.C.) there appeared a whole succession of rationalistic cosmogonies, each more complex than its predecessor. In Plato’s Laws the Athenian introduces the hypothesis that ‘all things come, have come, and will come into existence, either by nature, by art or by chance,’ a doctrine which he amplifies as follows:

The philosophers say that fire and water and earth and air all exist by nature and chance, and none of them by art, and that the bodies which come next in order—the

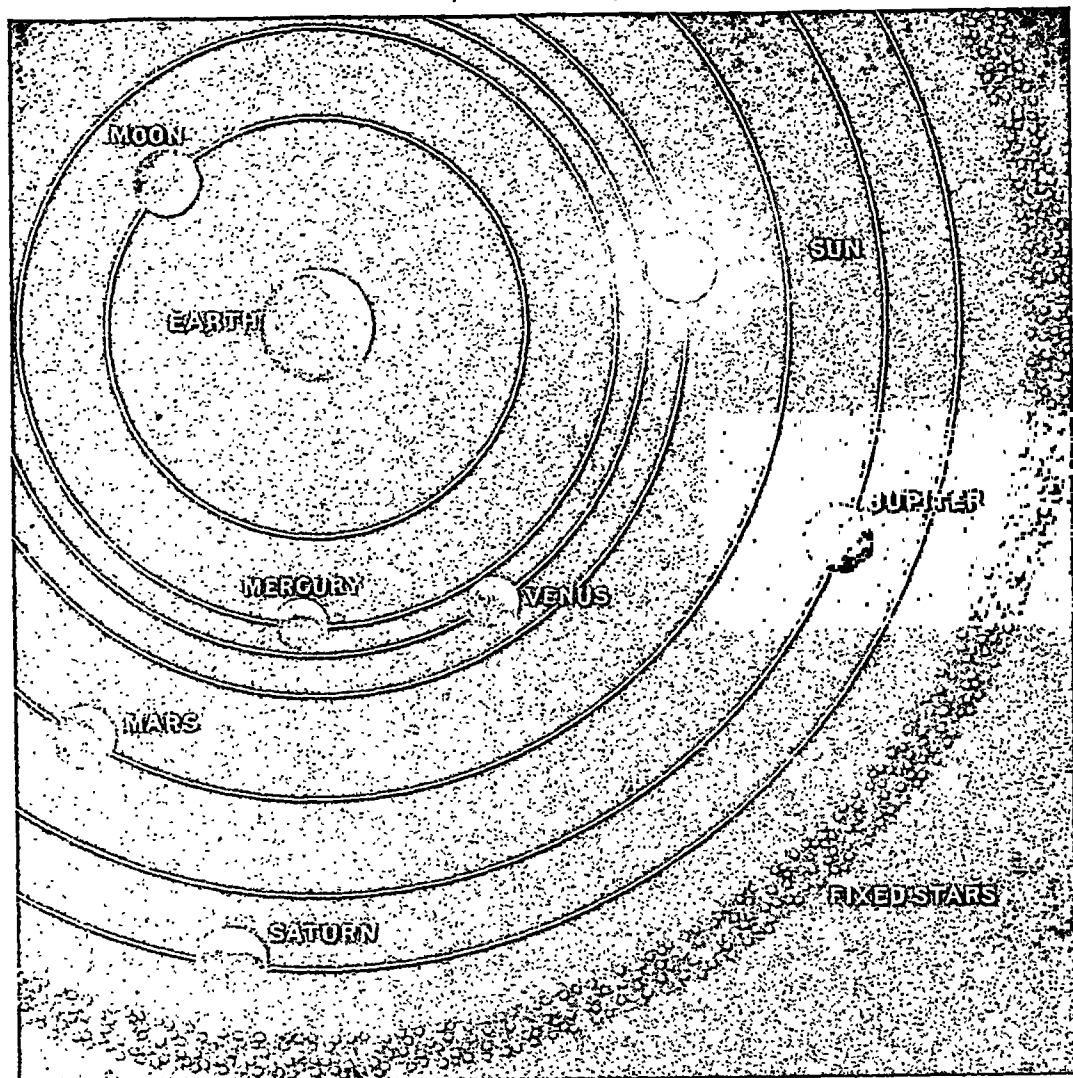
earth, sun, moon and stars—have been created by means of these absolutely inanimate existences. The various elements are moved by chance, and also by inherent forces according to certain affinities amongst them—of hot with cold, dry with moist, soft with hard, and according to all the other accidental mixtures of opposites which have of necessity happened. After this fashion has been created the whole of heaven and all that is therein, as well as all animals and plants and all the seasons. These come from these elements, not by any action of mind or of any god, or from art, but by nature and chance only.

The Greeks had no scientific knowledge adequate for the testing of such conjectures; they found one scheme as inherently probable as another, provided only that both ended up with the world as they saw it to exist. Some two thousand years were to elapse before science provided material of real value in cosmogony, and after this some two centuries more before any cosmogonic use was made of this material. During this period the cosmogony of Empedocles, Plato and Aristotle held almost universal sway.

According to their scheme of nature all matter is made up of the four elements, Earth, Air, Fire and Water, which contain the four qualities

of coldness, dryness, hotness and moisture. Greek views on the universe

‘Nothing comes into existence out of that which is not, but everything out of that which is,’ says Aristotle, so that there can have been no process of creation, merely a redistribution of the four elements and their four qualities, as described by Plato’s Athenian. Circular movement was regarded as the most perfect conceivable, and the sphere as the most perfect



UNCONTROVERTED FOR 14 CENTURIES : THE THEORY OF A GREEK ASTRONOMER

Ideas about the central position of the Sun had been foreshadowed in early Greek philosophy, but the scheme of the universe that held the field, in the most enlightened minds at least, up to the sixteenth century was that elaborated by Claudius Ptolemaeus of Alexandria (about A.D. 150). Compare this illustration, where the Earth is the fixed centre round which Moon, Sun, planets and stars revolve embedded in crystal spheres, with the actuality shown in page 75.

of surfaces. Consequently the Earth was supposed to be spherical, and to be fixed at the centre of the universe, which was itself spherical; while the planets and stars, attached to various rotating spheres, revolved round the earth in circles. The universe was believed to be finite, its boundary being the outermost sphere, the 'primum mobile' to which the 'fixed stars' were attached.

One radical defect of this scheme was that it assigned to our world a unique position at the centre of the universe, a position which, while gratifying to

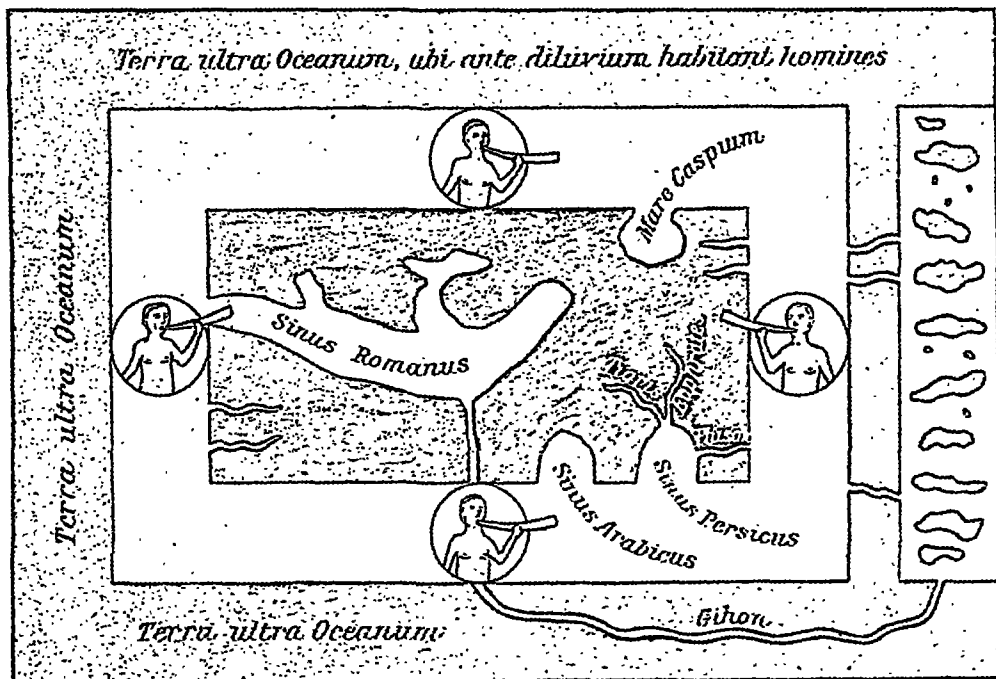
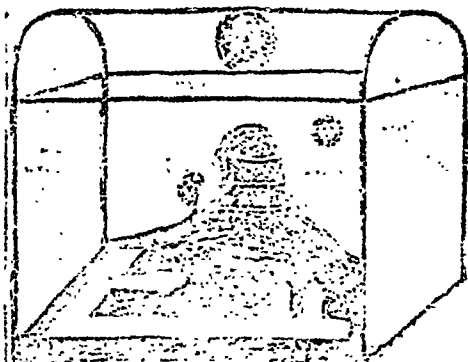
human vanity, was fatal to scientific progress. So long as the Earth was deemed to be unique, it was not much good trying to obtain scientific evidence as to the mode of its birth. If the birth of worlds were as common an event as the birth of kittens, it might be possible to discover how our own world had come into being by watching the birth of other worlds; but a general belief in the uniqueness of our world precluded any such attempt being made from the very outset, even if it had been possible. Further, the doctrine of the uniqueness of our

earth formed one of the essential corner-stones of orthodox Christianity, so that, as subsequent events amply showed, anyone who ventured even to conjecture the existence of other worlds similar to our own was liable to incur the very special displeasure of the Church.

Nevertheless, we find Nicholas of Cusa, a cardinal and a pillar of the Church, writing in 1440: 'I have long considered that this Earth is not fixed, but moves as do the other stars. . . . To my mind, the Earth turns upon its axis once every day and night.' That he escaped conflict with the Church which he ornamented was perhaps because it did not yet realise the full implications of his view that the Earth moved 'even as do the other stars,' but those who ventured to follow him in this line of thought fared less well. The last consolations of religion were withheld from his immediate disciple, Pietro Pompanozzi (1462-1525); Bernardino Telesio (1509-1588) saw his writings placed on the Index; while Giordano

Bruno (1548-1600), who expounded the implications of the Copernican astronomy when this arrived, was imprisoned for seven years and burned at the stake.

Copernicus himself had escaped conflict with the Church by withholding the publication of his great work, *De Revolutionibus Orbium Coelestium*, until after his death. The first printed copy reached him just in time for him to hold it in his hands before he died, happily too



FANTASTIC RESULT OF MONKISH SPECULATIONS ON THE UNIVERSE

Throughout the Dark Ages attempts were made to reconcile all natural phenomena with suppressed interpretations of the Bible. The most picturesque was due to Cosmas Indicopleustes of the sixth century, a traveller turned monk, who, from believing that the Tabernacle of Moses was a microcosm of the universe, arrived at the upper result, rather like a modern trunk, wherein lay a flat world as shown in the map below. The great Mountain of the North intercepts the rays of the Sun at night.

From Raymond Beazley's *Dawn of Geography*, Clarendon Press



FATHER OF MODERN ASTRONOMY

Not the first to feel the shackles of orthodox cosmology, but the first to break them, was Nicolaus Copernicus of Poland (1473-1543).

late for him to discover that a preface had been fraudulently inserted warning its readers that its conclusions were to be regarded as purely hypothetical.

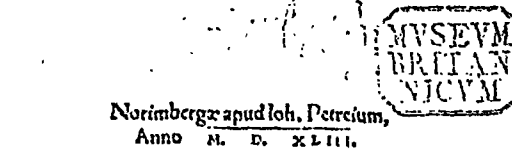
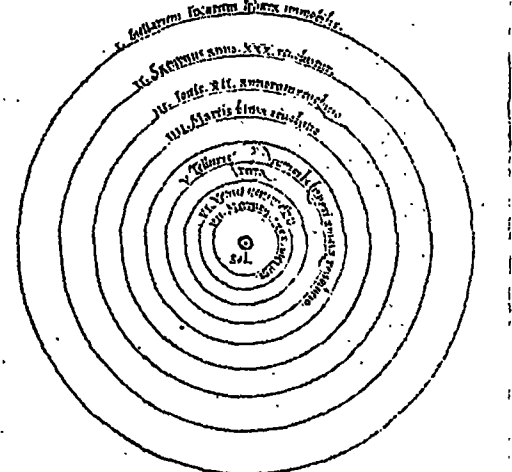
Although Copernicus had slipped beyond their reach, the Church was by now thoroughly alive to the threat which was involved, both to orthodoxy and to its own authority, in any promulgation of Copernican doctrines. The hue and cry was not limited to the Church of Rome; when Luther and Calvin joined in denunciation of the 'upstart astrologer who had dared to set his authority above that of holy scripture,' the two main factions of the Church were at one in their desire to stamp out enquiry after the truth. Yet the terrors of religion, while they may have delayed, entirely failed to arrest the progress of this enquiry.

In 1609 Galileo invented the telescope, and constructed the tiny instrument which is still lovingly preserved at Arcetri. This almost immediately revealed to him the



NICOLAI COPERNICI
net, in quo terram cum orbe lunari tanquam epicycle contineri diximus. Quinso loco Venus nono mense reducitur. Sextum denique locum Mercurius tenet, octuaginta dierum spacio circumcurrens. In medio uero omnium refidet Sol. Quis enim in hoc

Habes in hoc opere iam recens nato, et edito, studiose lector, Notus stellarum, tam fixarum, quam erratarum, cum ex ueteribus, cum etiam ex recentibus observationibus relictos: & notis insuper ac admirabilibus hypothesebus ornatos. Habes etiam Tabulas expeditissimas, ex quibus coidem ad quoduis tempus quam facillime calculare poteris. Igitur eme, lege, fructe.



pulcherrimo templo lampadem hanc in alio uel meliori loco poneret, quam unde totorum simul positi illuminaret. Siquidem non inepte quidam lucernam mundi, alij nientem, alij rectorem uocant. Trimegistus uisibilem Deum, Sophocles Electra inueniente omnia, ha profecto tanquam in folio regali Sol residens circum

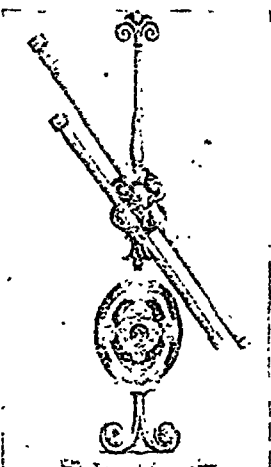
TITLE-PAGE AND DIAGRAM FROM A BOOK THAT SET THE WORLD AGOG

Copernicus—his name Koppernigk is usually Latinised thus—received only on his deathbed a copy of the book whose title-page is shown on the left. In it he had embodied the results of his life's researches, summed up in the pregnant diagram (right) where the Sun occupies its proper place as the centre of the solar system. Note that the planets Uranus and Neptune are still undiscovered.

phases of Venus. It had been urged as an objection to the Copernican theory that if the planets revolved around the Sun they ought at times to turn dark, or partially dark, faces towards the Earth; they ought in fact, to show phases like the Moon. Galileo's discovery, in 1610, that Venus actually exhibited such phases left but little room for doubt as to the essential truth of the Copernican theory.

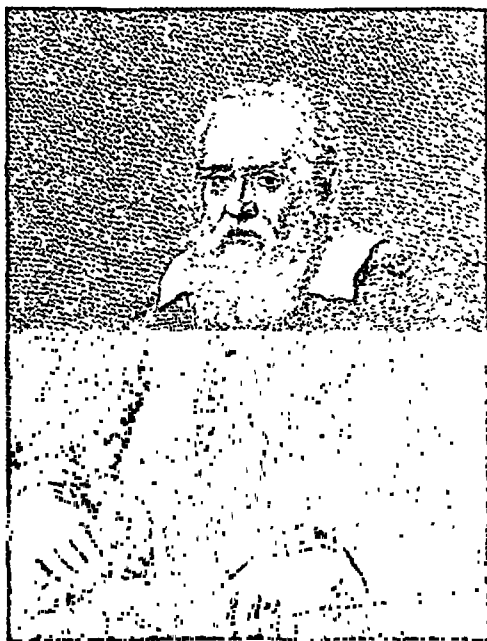
An even more convincing visual proof was to follow almost immediately, for the same year saw the discovery of the four principal satellites of Jupiter. Had it been possible for human eye to look through a telescope and see the Sun in the centre of his family of planets, these circling round him and so changing their positions every day, while he himself retained his majestic central position, then the acceptance of the Copernican system would have been assured at once and for ever. Such a sight may be a common one for the inhabitants of the planets of other suns, but the very nature of things prohibits it to us.

Galileo's telescope now revealed the fact that even if we could not see the planets wheeling round our Sun, other similar systems were open to our observation. Jupiter was seen to have a family of satellites circling round him in precisely the way in which Copernicus had imagined the planets to circle round the Sun, while Saturn and his family of satellites were observed shortly afterwards and found to conduct themselves in a similar way. The mere fact that there were at least two such systems in the universe could hardly fail to suggest that they had come into existence through the action of natural laws, rather than through some



MADE BY GALILEO

Through this minute instrument, preserved at Arcetri (compare page 58), Galileo gazed with wonder on the phases of Venus.



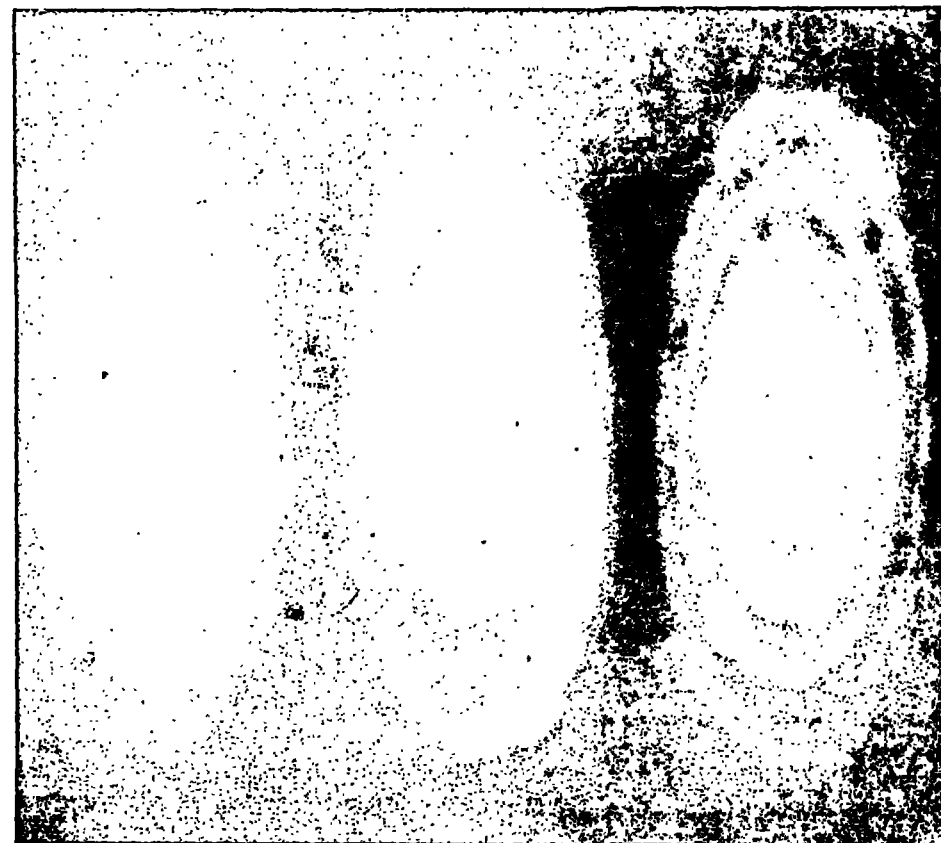
INVENTOR OF THE TELESCOPE

No confirmation of the doctrines of Copernicus was possible until Galileo Galilei of Pisa (1564-1642), working on the Flemish invention of the magnifying glass, perfected the first astronomical telescope, which at once afforded ocular proof.

special arbitrary act of creation. The problem of how the Earth had come into being immediately became a suitable subject for scientific investigation, and so was removed from the realms of fanciful speculation or religious dogma. The obvious line of attack would perhaps be somewhat as follows.

It might be hoped that further observation would disclose a whole series of systems similar to our own. Such systems would hardly have all come into existence at the same instant, so that it might be hoped to find planets of different ages, some older than our Earth, some younger, some perhaps still in process of being born. And out of these samples of planets at different ages it might be found possible to construct the life histories of planets and of systems of planets, and so to trace out the past history of our Earth.

Notwithstanding the vast recent growth of observational astronomy, this hope has not been fulfilled. As we shall shortly see, there are reasons for supposing that the whole solar system came into being almost



LAPLACE'S NEBULAR HYPOTHESIS : THEORY OF A FRENCH ASTRONOMER EXPLAINING PHENOMENA VASTER THAN HE IMAGINED
 Theories later proved false are sometimes more valuable to science than unimaginative research. Laplace propounded an hypothesis to explain the evolution of the solar system ; he postulated an immense cloud of glowing gas, shrinking as it lost heat and revolving faster as it shrank. At critical moments centrifugal force threw off rings of matter which condensed into the planets, while the residue is now our Sun. This is no longer accepted as applying to the solar system ; but swell the volume of the nebula by 1,000 million million times and this page might illustrate the birth of a star-colony.

Specially drawn by Scriven Bolton, F.R.A.S.

instantaneously, so that all its planets are of the same age. To find planets or satellites either younger or older than our Earth, we have to look to the systems surrounding other stars. These stars, however, are so remote that they appear as mere points of light in even the most powerful telescope, no telescope on earth having adequate power to show a planet as bright as Jupiter circling round even the nearest of the stars.

This line of attack, then, leads nowhere. Our telescopes show no planets or satellites except those of our own solar system, which, having all been born at the same time, provide no material for the study of the life history of planets.

The only method which remains is that of abstract scientific investigation. All astronomical bodies obey the universal laws of physics and mechanics, and if it were possible to give an exact specification of the present structure of any astronomical system, these laws would enable us to trace its history indefinitely in the direction both of the future and of the past. This is the method on which we must even now rely, but before describing modern applications of the method let us examine the use made of it by Laplace when he framed his famous nebular hypothesis in 1796.

Laplace knew little about the Sun except that it radiated heat and that the occurrence of sunspots, prominences and such phenomena at its surface

Conjecture precedes Knowledge indicated that its outer layers at least were gaseous. The general laws of physics suggested that a star which was partly or wholly gaseous could not continue emitting heat without undergoing some change of constitution. Laplace, believing that the emission of heat must necessarily be accompanied by shrinkage, was led to conjecture that the Sun had been of greater size in earlier ages than now; he thought of the primeval Sun as a huge nebula, or gaseous cloud, extending to some thousands of times its present dimensions.

The motion of sunspots across the Sun's surface indicates that the Sun rotates about its axis once every 27 days. Laplace saw that his primeval nebulous Sun must have rotated far less rapidly than this.

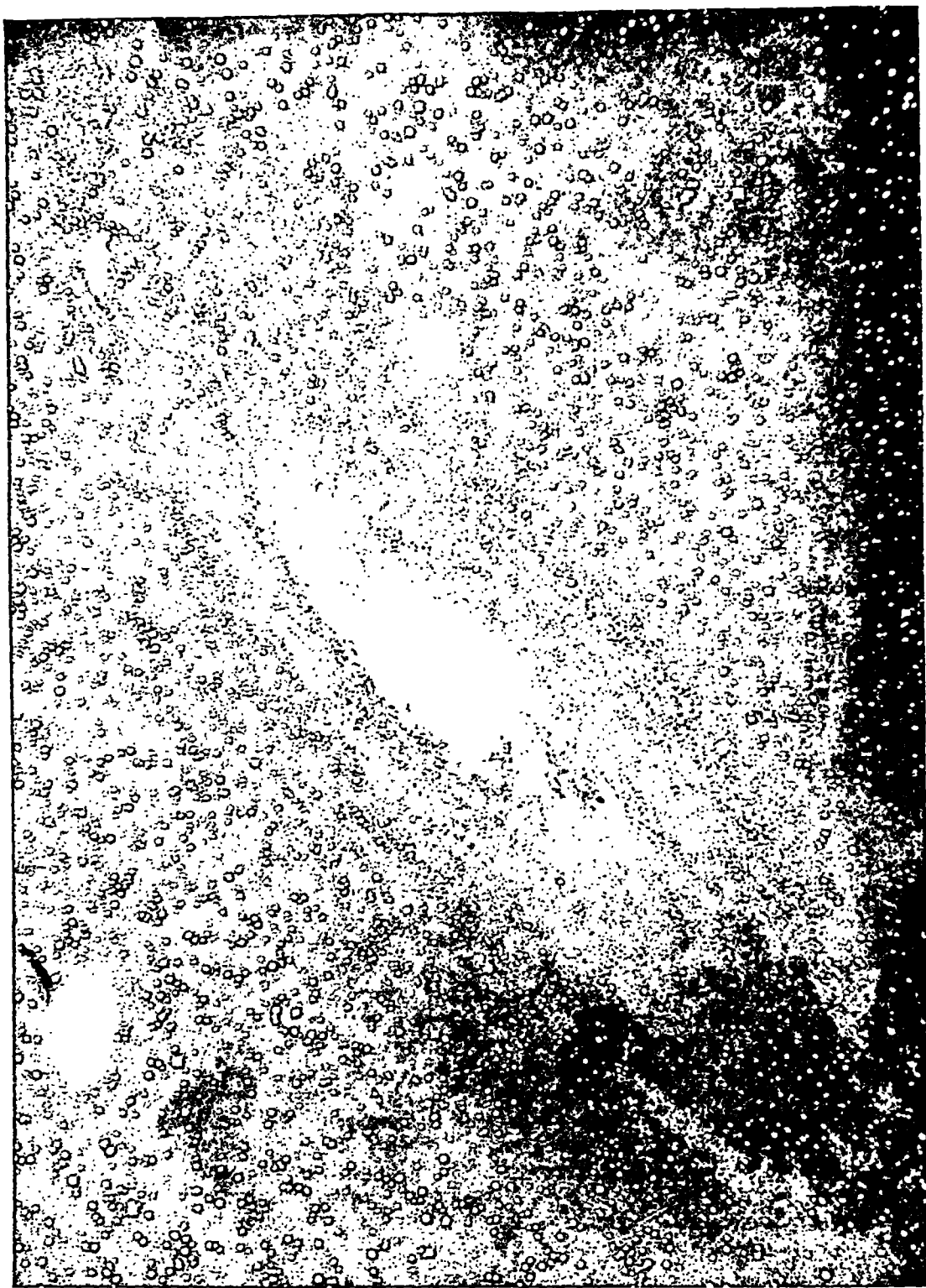


A FRENCH COSMOGONIST

Born in 1749, Pierre Simon Laplace, afterwards the Marquis de Laplace, was already famous at the age of twenty by reason of his brilliant publications on the integral calculus.

He imagined it to have had a diameter greater than that of the planet Neptune's orbit, and a very simple calculation will show that if such a nebula rotated once in 27 days, its outer layers would fly off into space, just as splashes of mud fly off a bicycle wheel when it rotates at more than a certain critical speed. In a sense no calculation is necessary, for we know that Neptune revolves round the Sun once in 165 years in an apparently circular orbit, and so keeps always at the same distance from the Sun, and from this it follows that if the primitive nebula had rotated faster than once in 165 years when its diameter was that of Neptune's orbit, its outer layers would necessarily fly off.

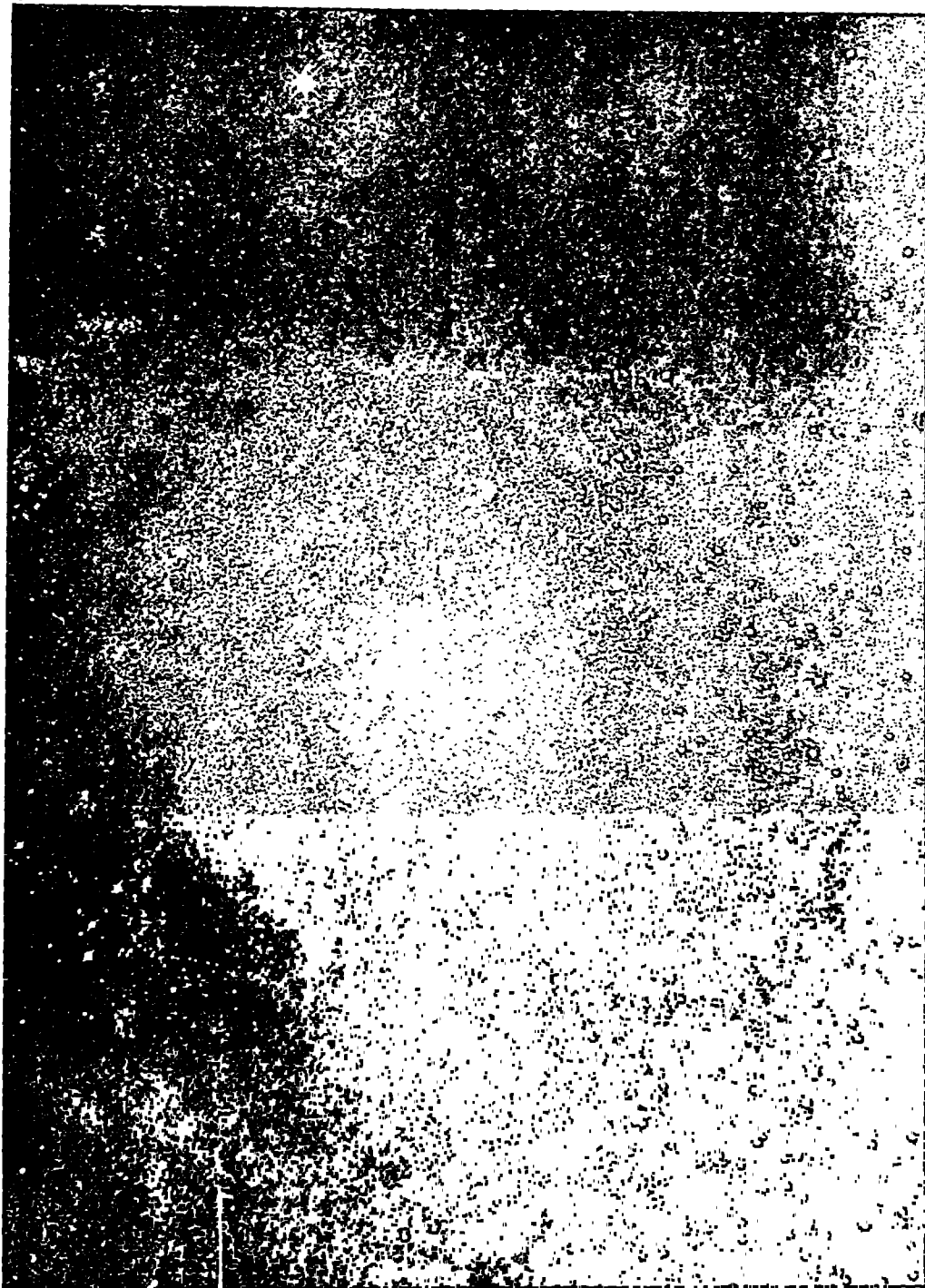
Laplace accordingly imagined his primeval nebula to be rotating very slowly. But a well-known mechanical principle, the principle of 'conservation of angular momentum,' requires that as a body shrinks its speed of rotation shall continually increase. Thus Laplace, while imagining his nebula to have started with



ANDROMEDA NEBULA: AMONG THE REMOTEST SPECTACLES THE SKY CAN SHOW.

The plate facing page 56 shows younger nebulae. Here, in the great spiral nebula in Andromeda, a large amount of the nebulous matter has already condensed into stars; but such is its distance—its light, travelling at 186,000 miles a second takes nearly a million years to reach us—that this page would have to be enlarged to the size of the Earth before a body as big as the Sun became visible in it under a microscope. A speck of dust in a sunbeam is as small to the Earth as our Sun to Andromeda.

Courtesy of Royal Astronomical Society



ONE STEP FURTHER IN THE STORY OF A NASCENT STAR-CLUSTER

With the nebula catalogued as N.G.C. 598, in the constellation Triangulus, we reach a very late stage in the birth of a star colony. Here most of the nebulous matter has condensed and almost the whole of the cloud, even in the centre, really consists of star-like points which prove on investigation to be, in fact, stars. Note, too, that the swarm has begun to 'break formation,' so that although a spiral arrangement can still be traced it is at this late stage of development very confused.

Courtesy of Royal Astronomical Society

enormous size and very slow rotation, supposed the rate of rotation to have increased gradually until, by the time its diameter was about equal to that of Neptune's orbit, it was rotating at the critical speed of one revolution every 165 years. A ring of matter then flew off and ultimately formed the planet Neptune, which has been revolving more or less in the same place and at about the same speed ever since.

The remainder of the nebula went on shrinking and rotating ever faster and faster, until by the time it had shrunk to the dimensions of the

Laplace and the present orbit of Uranus
Birth of Planets it was rotating once every 84 years. This speed

was again such that the outer layers of the nebula could no longer hold together, so that these flew off and formed Uranus. In this way Laplace imagined the planets to be thrown off one after another as the Sun shrank down to its present size.

Astronomers no longer believe that this hypothesis gives a true account of the origin of the Earth and its sister planets. Out of a multitude of objections two may be mentioned. If the primeval Sun was rotating at such a rate as to throw off Neptune, Uranus and the other planets in the way imagined by Laplace, then we can calculate, again from the principle of the conservation of angular momentum, the rate at which it ought to rotate when its shrinkage has reduced it to its present dimensions. And the calculated speed comes out nowhere near to that actually observed, the Sun's present speed of rotation is found to be too slow for it ever to have thrown off anything at all.

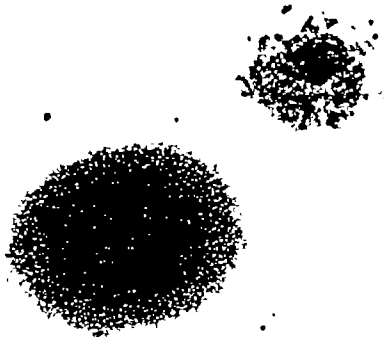
Further, the star which shrinks and rotates faster and faster is an object well-known to astronomers, it does not end in a family of planets at all, but breaks up into a double star—two stars of comparable size rotating about one another like partners in a never-ending waltz. Examples of this are frequent, in some the two components are far removed from one another, in others they are quite close together, as though the process of fission had only just occurred, while in others (although this is less certain) the process of fission is not yet complete and the future

'binary' star still forms one single elongated mass.

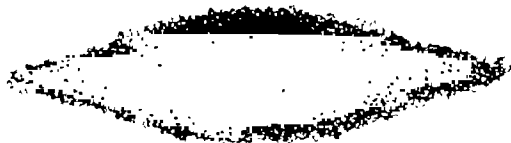
Although Laplace's hypothesis has failed to explain how the earth came into being, yet the process he imagined has proved to be one of the most important in the whole of theoretical astronomy. It is exemplified in thousands of instances all over the sky, each on a scale incomparably grander than anything imagined by Laplace. Innumerable nebulae are rotating too fast to hold together, and so are throwing off splashes of matter from their equators, but so great is the scale on which the process occurs that the products of the process are not families of planets but vast armies of stars. In this way our Sun was born, and Laplace, in trying to solve the mystery of the birth of the child, had solved, although without knowing it, the problem of the birth of the parent.

Figures 1, 2, 3, 4 and 5 in the plate facing this page show five nebulae selected from different parts of the sky. These are not a mere random selection, they have the special interest that they almost certainly constitute an evolutionary sequence (the nebula appearing in the top right-hand corner of Fig 1 should be disregarded for the moment). Each nebula has in all probability at some time in the past looked like each one of the nebulae preceding it in the sequence, and will at some time in the future look like each of the nebulae following it.

The first object in this sequence (the nebula at the centre of Fig 1) is a diffuse and nearly spherical nebula, it might well be taken as typifying Laplace's primeval nebula except for a colossal difference in size. For whereas Laplace imagined his nebula to have a diameter equal to that of Neptune's orbit, which light crosses in eight hours, the diameter of the nebula shown in Fig 1 is probably so great that light takes something like a hundred years to cross it. The difference in size is that between a speck of dust and a football, or between a walnut and Mont Blanc. A million of Laplace's nebulae might be rolled into one, and the composite nebula so formed would still be too small to be visible in Fig 1.



(1) Nebulae, whence the stars are formed, are vast, tenuous clouds of luminous gas scattered through space. In their earliest stages, shown by the lower of the two above, they are diffuse and often almost globular. (N.G.C. 4647-9)



(4) With further contraction and rotation, the matter surrounding the bright nucleus like a ring, is the size of these ne

(2) These nebulae revolve slowly, but as they shrink under the force of gravity their rotary speed increases. They become flattened at the poles (as seen in Fig. 1) and begin to bulge out round the equator. (N.G.C. 3115)



(3) After a certain stage the equatorial 'bulge' can go no further and still maintain equilibrium. Matter is then thrown off by centrifugal force, and can be seen as a dark band across the nebula above. (N.G.C. 5866)

(6) This would look much like the picture 'edge-on.' Note that the matter of the clots, as is also shown by the second ne

EIGHT ACTUAL PHOTOGRAPHS OF DIFFERENT NEBULAE, SHOWING IN

From photographs taken at Mount Wilson Observatory, California

The future history of this nebula must normally be one of shrinking and of rotating faster and faster, and the mathematician can calculate the sequence of events with very fair accuracy. At first the nebula will bulge at its equator and flatten at its poles, assuming the orange-like shape of which our Earth is an example; this stage is already indicated in Fig. 1. As the nebula shrinks further the flattening at the poles and the accompanying bulge at the equator develop more and more, until the bulge becomes so pronounced that the equator is replaced by a sharp edge, and the nebula is shaped like a double convex lens (the ordinary circular magnifying glass). This stage is shown in Fig. 2.

When this stage is reached, the equatorial bulge can go no farther. The next stage is that matter is thrown off from the equator. Fig. 3 shows a nebula in which this process has just commenced, the ejected matter appearing as a faint dark band across part of the equator. Fig. 4 shows a further development; the ejected matter now forms a complete ring, which appears as a dark band in the photograph. Finally Fig. 5 shows a still more advanced nebula in which the central mass has shrunk so far that its dimensions are quite small in comparison with those of the rings of matter it has thrown off.

This series of five nebulae have been chosen so that we see them all 'edge-on.' Fig. 6 shows a nebula which, if viewed 'edge-on'—that is, from a direction at right-angles to the actual line of vision—would probably look somewhat like Fig. 5. We notice the bright central mass and, surrounding it, the successive rings of matter which have been thrown off in earlier stages of its existence. Let us notice, also, that these rings tend to form granulations or condensations; such a tendency was already to be observed in the outer regions of Fig. 5, but we see it more clearly when we look at the nebula from above as in Fig. 6.

We see it also in the nebula which occurs in the top right-hand corner of Fig. 1. This nebula, which only appears accidentally, is one of the same type as those shown in

Figures 5 and 6, but is viewed at an intermediate angle. It is because a whole series of such nebulae bridge over the gap between the appearances shown in Figures 5 and 6 that we can be sure that these two nebulae are objects of essentially the same kind. In passing it may be remarked that Fig. 1 is of quite exceptional interest as showing two nebulae, one in a very early and one in a quite advanced stage of development, so close together that they appear on the same photograph.

In some ways Fig. 6 is an exception to the general run of nebulae, for it is very rare to find such perfect symmetry or such clearly formed rings of

matter as are shown. How spiral arms in this example. More are formed

normal appearances are those shown in Figures 7 and 8, and in the photographs in pages 54 and 55; in these the matter which has been thrown off forms arms of a spiral shape, as though it were not thrown off symmetrically from the whole equator, but only from two points opposite to one another, as indeed is probably the case.

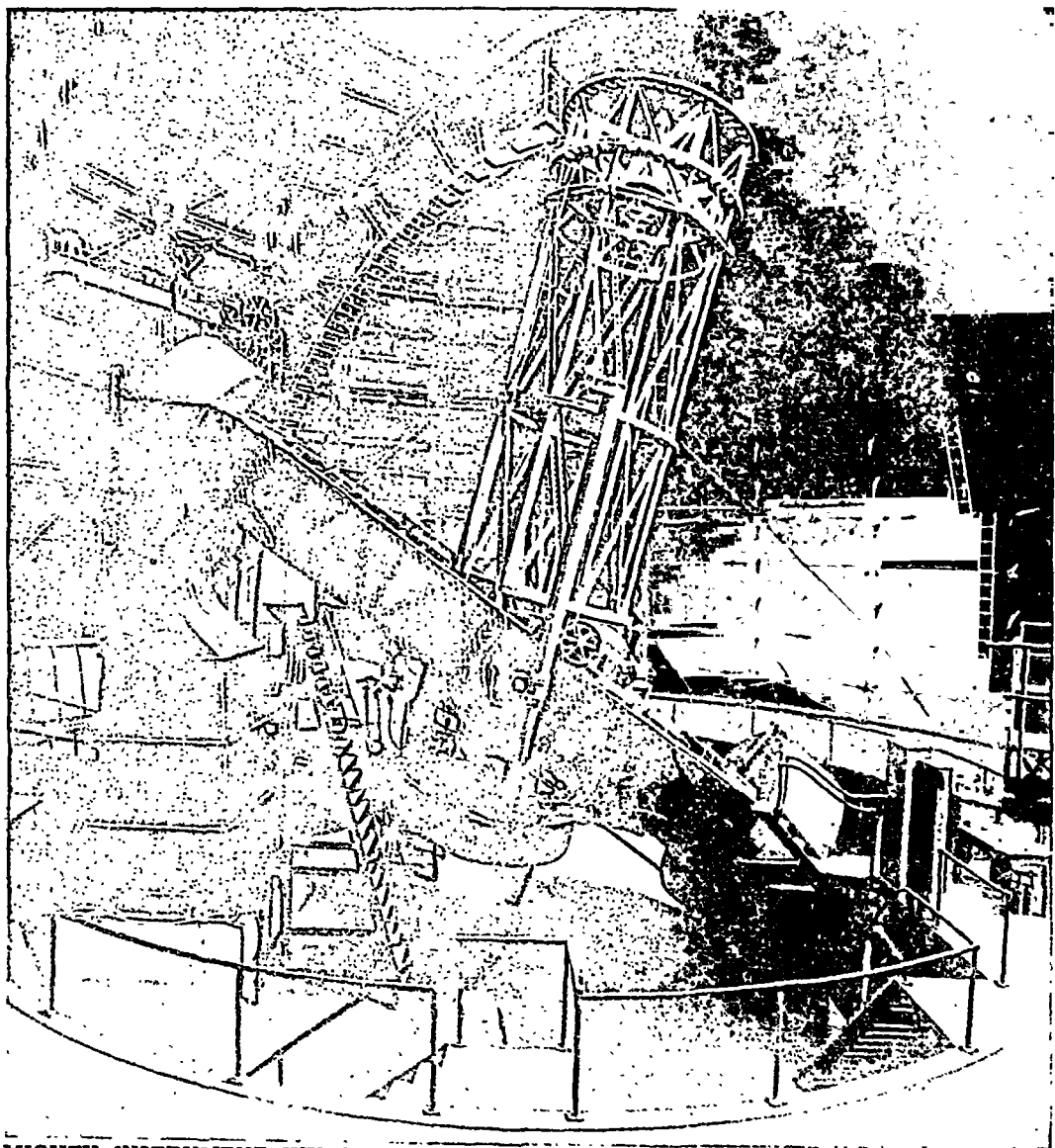
In the great majority of nebulae some appearance of condensation or granulation is present. Theoretically these condensations or granulations are of high importance. The mathematician can predict on purely theoretical grounds that they must occur, so that when they do occur he knows fairly accurately what they are; they are simply condensations of gas, mixed, perhaps, with a certain amount of dust or other cosmic detritus, which have formed somewhat in the same way in which drops of water form out of a uniform jet, but under the influence of gravitation instead of surface tension.

The mathematician can also calculate what amount of gas there must be in each 'drop,' and how far apart in space the drops must be. The first of these calculations shows that each condensation must contain at least as much matter as the Sun, and in general considerably more. The second calculation shows that the condensations, while not so far apart as the distance between the Sun and his nearest neighbouring suns, are enormously farther apart than the distances between the Sun and the planets surrounding it.

Incidentally this second calculation makes it possible to estimate both the distances and sizes of the nebulae ; it gives, so to speak, the scale on which these nebulae are constructed. Just as the rifleman, knowing that a man is about six foot high, can estimate his distance by the size the man looks, and adjust his sights accordingly, so the astronomer, knowing the actual distance between the condensa-

tions in a nebula, can estimate the distance of the nebula.

The results obtained are of profound significance. They prove abundantly that the process which is going on in the nebulae is no mere birth of planets from a nebulous sun ; it is for certain nothing less than the birth of suns, themselves perhaps destined to be the parents of planets. Our imagination carries us back to the three



MIGHTY INSTRUMENT WITH WHICH THE MYSTERIES OF SPACE ARE BEING PROBED

It was with the huge reflecting telescope at Mount Wilson Observatory, California, that much of the important work was done whose results are embodied in this chapter ; its 100 inch mirror lies at the bottom of the open steel cage. This photograph does not adequately convey its real size, for which one must compare the illustration opposite, where an observer is shown watching at the interferometer ; part of the great supporting cross-beam may there be identified in the top left-hand corner.

Courtesy of Royal Astronomical Society.

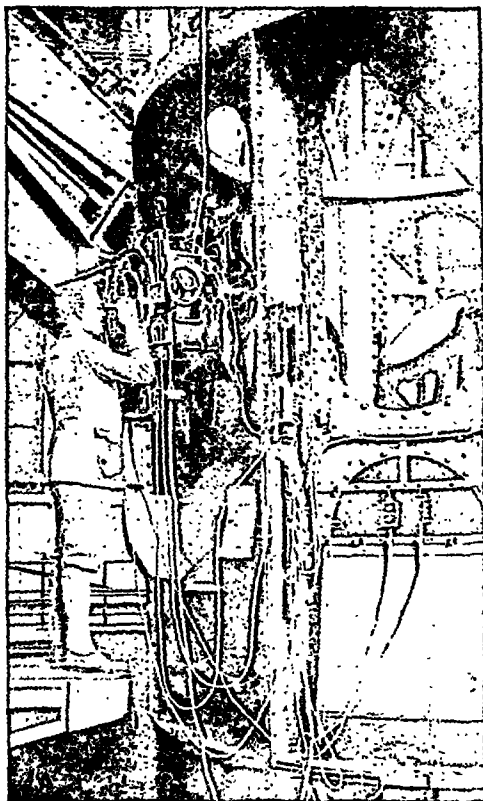
generations of Greek mythology, and we think of the nebulae as representing Uranus, the original father of all the heavens, while the stars form Cronus and the second generation, and the planets—Jupiter, Venus, our Earth and the rest—are the third generation, the abode of life.

In propounding his nebular hypothesis Laplace insisted on the necessity of rejecting all conjectures which were not 'the result either of calculation or of observation.' The modern cosmogonist is perhaps even more exacting and is inclined to reject all conjectures which are not confirmed by both observation and calculation. The conjecture that in watching the evolution of nebulae we are in actual fact watching the birth of suns was originally based mainly on calculation; and it might be thought impossible that direct observation could ever either confirm or disprove it, for how was anyone to weigh or measure the dimensions of a mass of gas and dust so remote that even the most powerful of telescopes showed it only as a tiny spot of light, invisible to the eye, and making its presence known only after hours of photographic exposure? But astronomy advances so rapidly that what appeared an obvious impossibility in the last decade is an established fact to-day.

In a well-developed nebula, such as those in Fig. 8 and in pages 54 and 55, a powerful telescope resolves the outer regions into a swarm of distinct bright points, which at least look like stars, while the central regions retain their nebulous appearance. On passing from younger to older nebulae, the area occupied by these star-like points continually increases at the expense of the nebulous central regions, appearances certainly suggesting very strongly that this latter is changing into stars.

The nebula shown in page 55 is of special interest as representing a very late stage of development in which hardly any of the nebulous centre remains; the giant 100-inch telescope at Mount Wilson, California, has recently shown that it consists almost, if not quite, completely of star-like points. What are these shining masses which appear like stars?

The answer given by the astronomy of the last few years is that they are in



INSTRUMENT OF AMAZING DELICACY

By means of the interferometer, attached to the 100-inch telescope, it is possible to measure by direct observation the angular diameters of many of the bigger or nearer stars, though none is as great as that of a pin-head six miles away.

Courtesy of Mount Wilson Observatory

actual fact stars of kinds that we find in other regions of space. The majority of stars shine with a steady, unvarying light, but it has long been known that certain 'variable' stars exist whose brightness varies from day to day. A special class of these, the Cepheid variables, has recently proved of the utmost importance both to general astronomy and to the special problems of cosmogony.

These stars show such marked and peculiar characteristics that a few days' study enables the astronomer to recognize a Cepheid variable with certainty—he can pick it out with the same confidence with which a sailor picks out the flash of a light-house from a miscellaneous crowd of lights on shore. Now the nature of the star-like points in the nebulae is settled by the circumstance that the 100-inch telescope

has recently revealed a large number of Cepheid variables in the outer regions of many of the nebulae, especially those in the three photographs mentioned.

These Cepheid variables have the valuable property that the rapidity of their light variation discloses the total

amount of light they

What the Cepheids teach us emit. Cepheid variables in general appear to be of very different bright-

nesses, but the differences in apparent brightness result to a large extent from differences in distance, nearer stars naturally appearing brighter than more distant ones. But in a group of Cepheids which are known all to be at the same distance, as for instance the Cepheids in a single nebula or in a single star-cloud, the more slowly varying stars are always the brighter, and two Cepheid variables which vary at the same rate are found to be of the same brightness. Thus if two Cepheids in different parts of the sky are observed to vary at the same rate, their differences in brightness can be attributed wholly to their different distances, and if the distance of one is known, the distance of the other can immediately be calculated.

In this way it is possible to estimate the distances of all the nebulae in which Cepheid variables can be observed. We can further compare the apparent brightness of the Cepheids in any nebula with that of other star-like points, which, being in the same nebula, are at the same distance from us, and thus estimate the luminosity of the latter; they are found to be quite ordinary stars. Finally, by methods which are too complicated to explain here, the masses of these stars can be calculated from their luminosities and the quality of light they emit.

Thus the discovery of Cepheid variables in the spiral nebulae has made it possible to evaluate, by direct observation, the two quantities which had previously been evaluated by abstract theory alone, namely, the distances of the nebulae and the masses of the condensations or stars which appear in their nebular arms. It is gratifying that the two methods of evaluation agree as closely as could reasonably be expected, so that the astronomer can to-day claim to know, as the result

both of theory and observation, the distances of the nebulae and also the masses of their condensations. And both evaluations agree in assuring us that the star-like points on the confines of the big nebulae must be newly-born stars.

The astronomer expresses the distances of the nebulae by such statements as that the nebula shown in page 55 is about 850,000 light-years distant, and that the great Andromeda nebula shown in page 54 is about 950,000 light-years distant. Light is known to travel at 186,000 miles a second, so that it would travel round the Earth in about a seventh part of a second. Light starting out from the Earth would reach the Moon in a little over a second, would reach the Sun in eight minutes, and would pass entirely beyond the solar system within four hours. Yet it would have to travel for nearly a million years to reach the Andromeda nebula.

In actual fact, of course, the passage of light is in the other direction; we see the nebula by light which has travelled from it to us. And this light left the nebula almost a million years ago, so that it shows us the nebula as it was and where it was a million years ago. It started when our remote ancestors of 30,000 generations back walked the Earth; through the whole of their lives, and those of their sons and sons' sons to 30,000 generations, the light has been travelling at a steady rate of 186,000 miles every second, and has only just reached us.

This gives us some conception of the scale on which the universe is built. The distance from us to the Andromeda nebula is not the whole radius of the universe, but is probably comparable with it. Vast dimensions of the Universe

Comparatively few objects are known which are farther away than the Andromeda nebula, and it is likely, although far from certain, that comparatively few exist.

The greatness of our distance from the Andromeda nebula suggests as a corollary that the nebula itself must be of colossal size to be visible to us at all. Calculation demonstrates that its actual diameter must be something like 30,000 light-years. The ratio between the 30,000 years which light takes to traverse the nebula and the

eight hours which it takes to cross the whole solar system gives the ratio of the sizes of the two structures. The whole solar system would be represented by a mere speck of ultra-microscopic size in the photograph given in page 54; indeed this photograph would have to be enlarged until it was as large as the Earth itself before a body of the size of the Sun became visible in it, even with the help of the most powerful microscope.

In respects other than size, the nebula is built on an heroic scale. The total amount of matter it contains is some thousand million times as great as that in the whole solar system. The speed of its motion is prodigious; it is approaching us at a rate of about 200 miles a second, while its outer parts have a velocity of rotation about its centre which is still higher. And yet such is its size that these outer parts must travel for some 20 millions of years before they have performed a complete revolution.

The conception of these majestic rotations of the nebula, each taking some 20 million years or so to perform, inevitably raises the time question. How many of these rotations does the nebula perform in its life, how far can we trace its history back into the past, and how far will it extend into the future? This brings us to one of the most recent and fascinating chapters of astronomical progress.

Our Sun radiates energy in the form of light and heat at a rate which we can estimate by measuring the rate at which solar heat reaches the

earth. If a power station of Solar Energy were built outside the Sun and charged with the task

of supplying the Sun with energy as fast as the Sun radiated it away, this station would have to burn coal at a rate of three million million million tons a minute. As no external source of energy is known which can provide more than a tiny fraction of the energy radiated away, we must suppose the Sun's radiation to originate from something stored up in its interior. Now if the whole of the Sun were nothing but a mass of pure coal waiting to be burnt, the burning would supply energy for only a few thousand years at the Sun's present rate of radiation.

The falling in of the Sun's mass under its own gravitation could provide energy for a much longer period, some twenty million years, but this is still far too short to be reconciled with the Earth's geological evidence. For the oldest terrestrial rocks carry in them clear evidence of having existed continuously, in their present solid form, for some 1,500 millions of years, and no view of the Sun's radiation can be accepted which does not provide for radiation over a longer period than this.

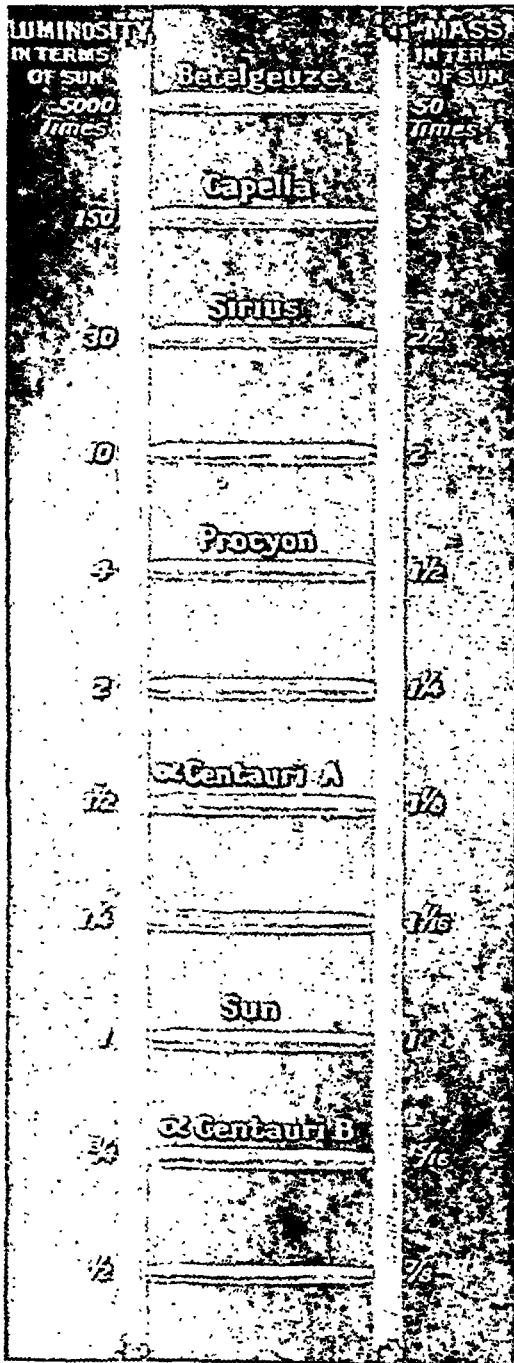
The hopes at one time held out by radioactivity have not materialised; a sun made of pure radium would radiate far more fiercely than the present Sun, but radium has no capacity for lasting for more than a few thousand years. Uranium alone has the requisite lasting capacity, but a sun built wholly of uranium would radiate at only about half the rate of our Sun. Thus we must conclude that no source of energy known to us on earth can account for the Sun's radiation.

The theory of relativity teaches that any radiation of energy is necessarily accompanied by a loss of mass in the radiating body. The loss

of mass corresponding to a known radiation of energy is easily calculated, and it is found that the Sun must be losing mass at present at the rate of about four million tons a second. Judged by our terrestrial standards this seems enormous, but the Sun can stand the drain for a very long time without any appreciable diminution of this great mass; radiation for the 1,500 million years during which we know the Earth to have existed would reduce the solar mass by only a hundredth part of one per cent.

Astronomy provides evidence that the stars have existed for periods enormously greater than this, periods which must be measured in millions of millions of years. In such a period the loss of mass would not be negligible; it would be a considerable fraction of the whole mass of the star. Hence it seems likely, and indeed almost inevitable, that the stars obtain most of their energy of radiation by an actual annihilation of their mass.

The combustion of coal does not, of course, annihilate the atoms of which the



THE LADDER OF STELLAR DECAY

The rungs of this ladder (see explanation in text) illustrate the parallel loss of mass and luminosity in a star as it grows older. All stars drop down the ladder step by step, each step representing about a million million years of a star's life.

coal is formed, it merely rearranges them in combination with some added atoms of oxygen; the burning process merely skims off the very topmost layer of the energy resident in the coal. Nor does radioactivity

involve the annihilation of the electrons of which atoms are built up. The energy produced by the annihilation of matter is of a different order altogether; the annihilation of one ounce of coal a day would provide more than enough energy to run the whole of the industries, transport and domestic lighting and heating of the British Isles. It is by the successive annihilation of ounce upon ounce, ton upon ton, and millions upon millions of tons of his mass, that the Sun is able to maintain his output of energy for millions of millions of years. We must think of each atom in the Sun as a store of bottled up energy; these bottles are continually being broken and their imprisoned energy set free in the form of light and heat with a corresponding diminution in the Sun's total mass.

This is something more than a mere conjecture; it is a conclusion which established facts make almost inevitable, but direct observational confirmation is nevertheless not unwelcome. In a variety of ways astronomy has been able to decide which are the older and which the younger of the stars. The stars are, in fact, found to form a single evolutionary sequence, and it is possible to arrange them in their order in this sequence with very fair accuracy. On doing this, it emerges that the order of age is almost precisely identical with the order of mass—that is to say, of the total weight of matter they contain. In other words, the stars get less massive as they grow older, which is the evidence required.

In human life a grown man has twice the weight of a boy of eleven, who in turn has twice the weight of a boy of four, who has twice the weight of a baby of seven months, and so on. A similar table could be constructed for the stars, but the youngest stars would be the heaviest. For every ton of matter in the very young star Betelgeuze, there is only about a hundred-weight of matter in the older star Sirius, and only about forty pounds in our still older Sun.

This is not, however, the end of the affair. For when we know the rate at which a star is radiating energy away, a simple calculation gives the rate at which he is losing weight, and this in turn gives the time necessary to take the next step

down the evolutionary ladder to the next stage of smaller weight. The result of calculation can be exhibited diagrammatically in the form of a ladder, as in the illustration in the opposite page. While no extreme accuracy can be claimed for such a simple method, yet it suffices to show the main facts of stellar evolution.

In this diagram evolution is downwards, from the higher parts of the ladder to the lower. The step from each rung of the ladder down to the next lower occupies approximately a million million years. Thus the 1,500 million years, which seem such a stupendous age for our Earth when judged by terrestrial standards, fade into insignificance when viewed in terms of the stellar time-scale; they are represented by less than a six-hundredth part of one single step of the ladder.

The approximate amount of matter contained in each of the stars which stand on any rung of this ladder is shown by the number on the right of the ladder; this represents the star's mass on a scale in which the Sun's mass is taken to be unity. Similarly, the approximate luminosity of the stars on any rung is shown by the

On the ladder of Stellar Life | figures on the left; these give luminosities on a scale in which the Sun's luminosity is taken as unity. Sirius, for instance, which stands six rungs up above the Sun, is seen to contain some two and a half times as much matter as the Sun; we should have to roll two and a half stars like our Sun into one to get a star as massive as Sirius. We should also have to take thirty stars each as luminous as our Sun and place them all together to get a light as bright as that of Sirius.

This diagram can be used in still another way, for it shows that six million million years ago the Sun was thirty times as luminous as it now is, and contained two and a half times as much matter as now; the reduction in its mass of course represents the total amount of radiation which has been emitted in the interval. And in six million million years—if nothing happens to change the normal course of events—Sirius will be reduced in glory until his mass and his luminosity are no greater than those of our present Sun.

A general study of the numbers on the right and left of the ladder at once discloses one salient feature. Both the mass and the luminosity of a star run down far more rapidly in its first period of a million million years than in any subsequent period. We do not quite know where the ladder begins; but it hardly matters much, for the change is so rapid at first that the period of time represented by the part of the ladder above that shown can hardly be very great.

To a tolerably good approximation we can count ages from the highest rung of the ladder in the opposite page, and say that Capella is one million million years old, Sirius

How old can a
Star become?

two million million, the Sun between seven and eight million million, and so on. A reservation has to be made in the case of binary stars, since an abrupt redistribution of mass occurs when fission into two stars takes place. There can of course be no definite bottom end to the ladder, for however old a star is it can still get older; the ladder goes down endlessly into eternity.

There may be a definite limit to the depths of the ladder to which stars have so far penetrated, but it is hard to say what this limit is, because as stars get older they also become more invisible, so that it is very difficult to pick out the oldest stars of all. The oldest stars known to us are perhaps something like 200 million million years old, so that we can extend our ladder nearly 200 rungs below the lowest shown and the rungs will still be tenanted by stars. We see that our Sun is a comparative youngster.

Possibly the ladder has no very definite top. Some stars may be born out of their parent nebulae with masses about fifty times as great as that of the Sun, and so start on the top rung shown in page 62, while others, born with a mass only about five times as great as that of the Sun, start one rung down. Even the stars which are born out of a single nebula must not be expected all to start with equal masses, but stars born from different nebulae are likely to be far more unequal than those born out of a single nebula. Calculation shows that the stars born out of most of the big nebulae, such as that in Fig. 8,

ought to have average masses of something like ten or twenty times the mass of the Sun. This agrees well enough with what is observed, for stars with masses as great as twenty times that of the Sun are very rare, while stars of masses well below ten times are quite common.

A further consideration connected with the birth of stars may be mentioned here. We have already noticed the enormous size of the spiral nebulae, and mention has been made of their enormous mass. The mass of the Andromeda nebula is about a thousand million times that of the Sun. But the size of the nebula is a million million million million times that of the Sun, so that it exceeds the Sun far more in size than in mass.

To put it in another way, a ton of matter must take up far less room in the Sun than it does in a spiral nebula; the

Sun is far more compact,

Illustration of or, to use the proper
Nebular Tenuity scientific term, more

'dense.' Let us imagine

that every atom of air is extracted from the Albert Hall, and that when this has been done a common house fly takes one breath of air and discharges this lungful of air into the Albert Hall. Following the laws of gases, this breath of air must expand and fill the whole Albert Hall; yet when this has happened the air in the Albert Hall will be considerably more dense than that of nebular material. Without labouring the point further, it will be clear that newly-born stars must be expected to be of extreme tenuity; and such is found to be the case.

It has recently been possible to measure by direct observation the diameter of Betelgeuze, the star which we have selected as a typical new-born star to stand on the topmost rung of our diagrammatical ladder. The fact that the angle subtended by this star is found to be rather less than that subtended by a pinhead at a distance of six miles will give some idea of the difficulty of the observations. The star is found to have a diameter about 300 times as great as that of our Sun, so that his mass, which is only about fifty times that of the Sun, occupies a volume equal to about twenty-seven million times that occupied by the Sun. A simple calculation

now shows that the average density of Betelgeuze must be about one four-hundred-thousandth that of water, or about a five-hundredth part of the density of atmospheric air. The ordinary air in an average room on earth weighs about a hundredweight, but a roomful of the gas of which Betelgeuze is formed would weigh only about three ounces.

At the other end of the scale comes a group of old stars known as 'white-dwarfs.' Their average density is about 50,000 times that of water, while the density in their central regions is probably a full million times that of water—a golf ball made of matter of this density would weigh about 50 tons, while a roomful of this matter would weigh some two million tons, a weight sufficient to sink the whole of the British Navy. Between the very tenuous stars, such as Betelgeuze, and these there is a continuous succession of stars of ever increasing density, and there is little room for doubt that this succession is also one of increasing age. We have already seen that as a star gets older its mass continually decreases; its luminosity also decreases. We now see that its density increases, so that it becomes more and more compact.

This may end our survey of the birth and life-histories of stars, the parents of planets. We started from the nebula, behind which we cannot

at present penetrate, and have seen how dynamical

Birth of a star
summarised

forces, arising from the gravitational attraction of its parts, cause it to assume a regular shape, to spin faster and faster until finally matter is thrown off its equator much as drops of rain are thrown off the rim of a whirling umbrella. These 'drops' are stars, but not stars on the comparatively puny scale of our Sun. The condensations in the arms of a spiral nebula represent a procession of stars of an altogether more heroic type. Each star, while perhaps some ten or twenty times as massive as our Sun, is thousands of times as luminous and millions of times as large. But in contradistinction to living organisms the fate before them is to grow steadily less impressive as they grow older. Heaven lies about them in their infancy, but after a few

hundred thousand millions of years, the shades of the prison house begin to close about them; they shrink in size, diminish in mass, their luminosity becomes dimmed and they are well started on the long path which ends in ultimate darkness.

While the stars are broadcasting their mass in the form of energy-radiation, they are moving about in space, each star having its path determined by the gravitational attraction of other stars. It might be thought that after a short time the stars born out of different nebulae would become inextricably mixed in space and that space would become uniformly peopled with stars; but this does not prove to be so. The astronomer commands means for probing the distribution of stars in space, and the first outstanding fact he encounters is that after proceeding a certain distance in any direction whatsoever, there is a very marked thinning of stars.

We have already pictured to ourselves the million-years-long passage of a ray of light from the Andromeda nebula to our Earth. For the first few thousands of years this ray is passing between the stars which form the outlying regions of the nebula. For the last hundred thousand years or so it is passing through regions of space which are tolerably well filled with stars. But in the intervening period, which represents by far the greater part of its journey, it is voyaging, if not through absolutely empty space, at least through space in which stars are scattered very sparsely.

Investigation shows that the stars fall into distinct colonies, so far apart that emigration from one colony to another is comparatively rare.

Island Universes Herschel described these of myriad Suns colonies as 'island universes,' and there is no

need to cavil at this description to-day, although many, perhaps most, astronomers would prefer to picture the grouping of the stars as that of a continent surrounded by islands. In any case, the colony of stars of which our Sun is a member is the largest group known to us, and the Sun is not very far from its centre. The general shape of the colony is that of a biscuit or lens; indeed, it is somewhat similar in shape to the nebulae shown in Figures 2 and 3; the Milky Way forms its

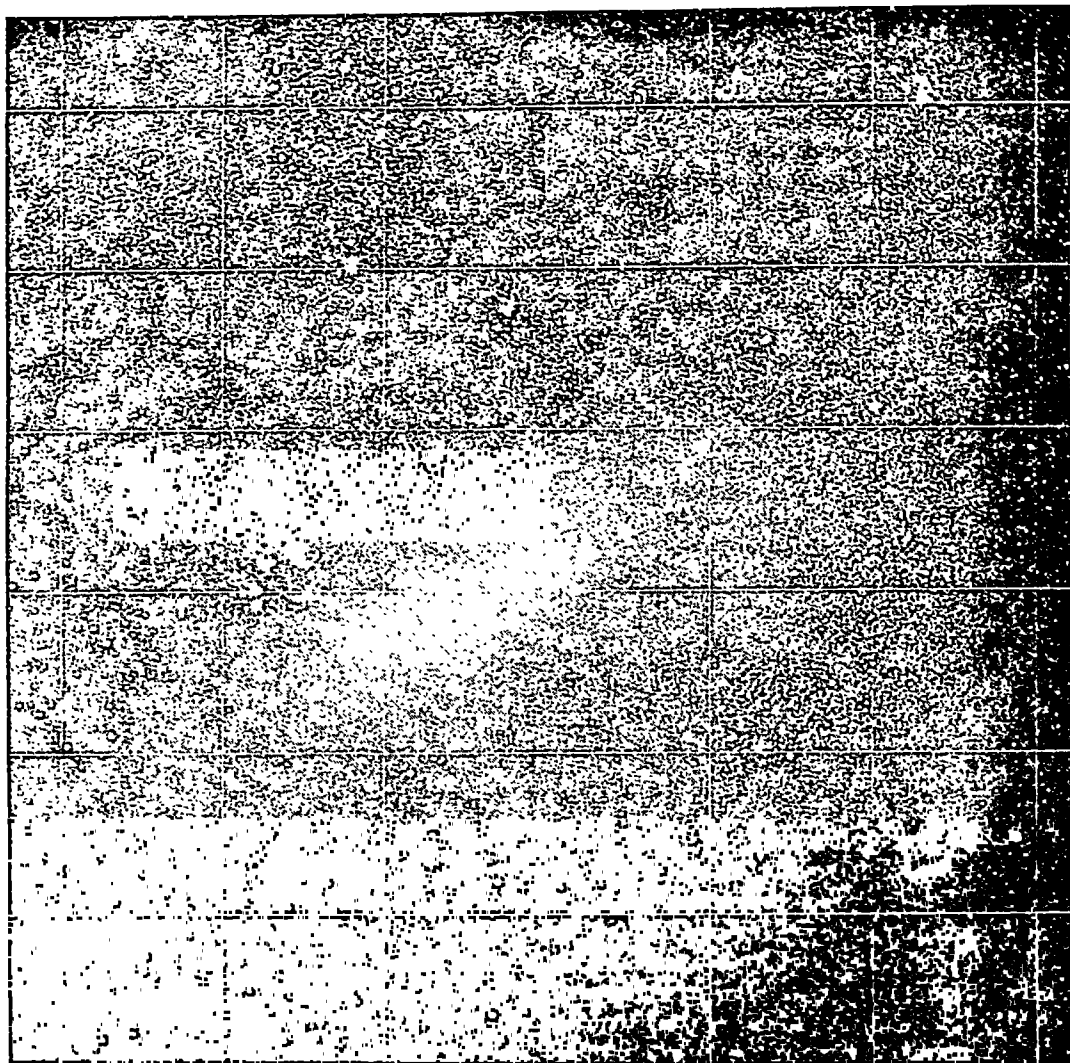
equator, and the reason that stars appear to be so thickly scattered along the Milky Way is merely that here we are looking through the greatest diameter of the lens. Looking towards the galactic poles we are looking along the shortest diameter; we soon come to outer space, and so see but few stars.

In page 66 is a colony of stars, the Greater Magellanic Cloud, which lies on the confines of the Milky Way. The stars which it contains are in many respects similar to those in one of the big well-developed spiral nebulae, such as that shown in page 55, and it seems likely that such a star-cloud may be the final product of a spiral nebula of this type; if so, this picture may be tacked on to the series already given, and the complete sequence will form a photographic description of the evolution of a colony of stars.

The photograph in page 67 shows another colony of stars still more remote. Its distance is so great that only the very brightest of its stars are visible at all. Each point of light in the photograph represents a star whose luminosity is many times as great as that of our Sun; stars having the luminosity even of Sirius are invisible, so that we can only see the stars which stand on the topmost rungs of our ladder. It seems that such a star-cluster may be the final product of a nebula of smaller size.

The stars of any one colony move irregularly past one another, much like a swarm of bees round a hive. The motions of the stars near to our Sun, which have been examined in considerable detail, show very little regularity, although it is true that the stars fall fairly clearly into two main streams, and a variety of smaller streams has also been detected. If we may not compare stellar motions to the random motions of a swarm of bees, we may at least think of them as similar to the motions of two swarms which have got mixed up together and are not far from inextricable confusion.

Bees, however, look where they are going; stars cannot. As they rush blindly on their courses they must at intervals run into one another. Actual collision must be very rare as a consequence



STARRY MAZES OF THE GREATER MAGELLANIC CLOUD

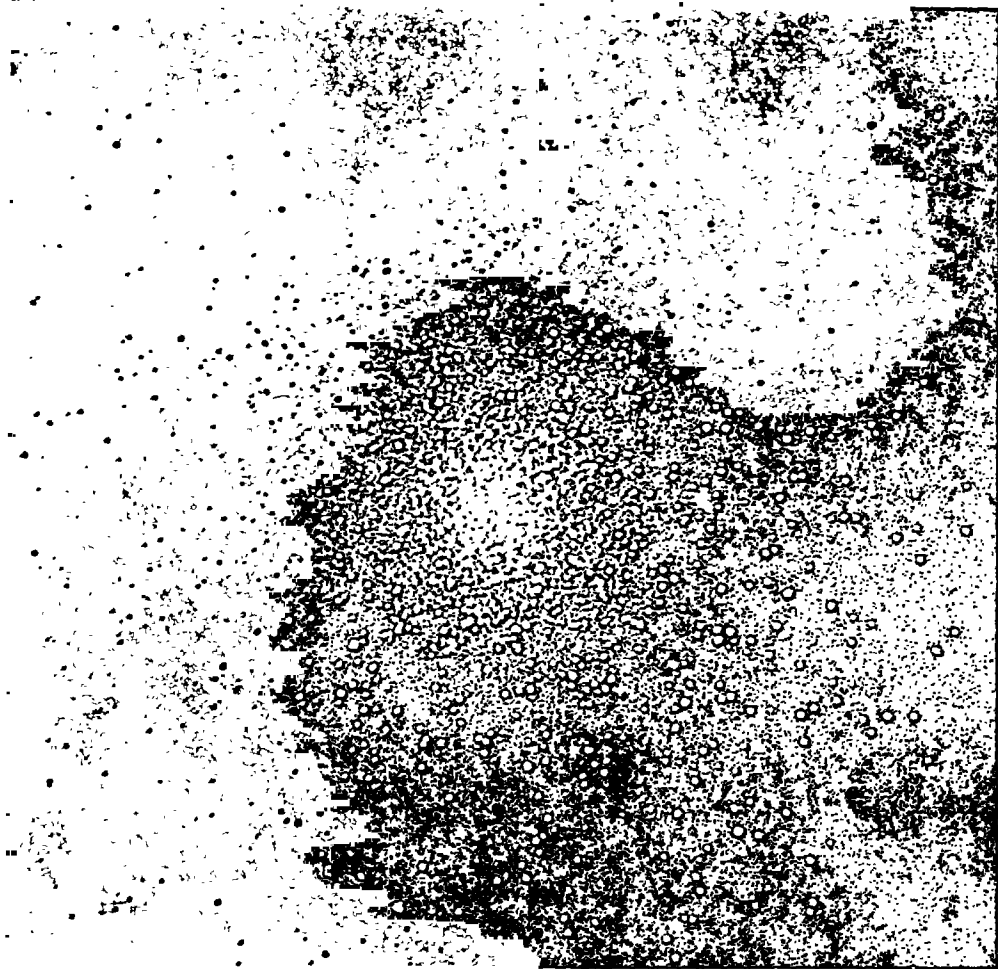
The ultimate product of one of the larger spiral nebulae is probably shown in the Greater Magellanic Cloud (Nubecula Major)—a patch of densely crowded stars, somewhat like the Milky Way. Only wisps of nebulous matter remain, but the outlines of a spiral are still dimly apparent. The photograph, ruled because part of the Franklin-Adams Chart, was taken at the Cape of Good Hope Observatory.

Courtesy of Royal Astronomical Society

of the great intervals which separate the stars. If we place an apple at the centre of the Earth and place a grape-fruit, two more apples, two apricots and a currant in the six continents of the Earth's surface, we shall have a fairly good scale-model of the arrangement in space of our Sun and its six nearest neighbours. We can represent the motion of these stars in our model by supposing all seven fruits to move about completely at random at the speed at which the ends of the hour-hands of watches and small clocks move. It is at once clear that collisions must necessarily be very rare events; even close approaches will be very rare, although

neither collisions nor close approaches can be entirely dismissed from consideration in a universe in which the stars have been 'swarming' for millions of millions of years.

An approach of two stars, even if not close enough for an actual collision to take place, may have profound cosmogonic consequences. Every star in the universe influences every other star, no matter how far away it may be, through the agency of universal gravitation. When the stars are far apart their mutual influence is exceedingly slight, but when they are fairly close together the effects of gravitation may become highly important. The Moon,



A SWARM OF STARS THAT WAS ONCE A CLOUD OF GAS

As the Greater Magellanic Cloud is the product of a big nebula, so one of the smaller nebulae may result in a star-cluster like that shown above. It is so far away from us that even Sirius, apparently the brightest star in the heavens, would be invisible if placed at the same distance; each of the stars seen here must therefore have an actual luminosity immensely greater than that of Sirius.

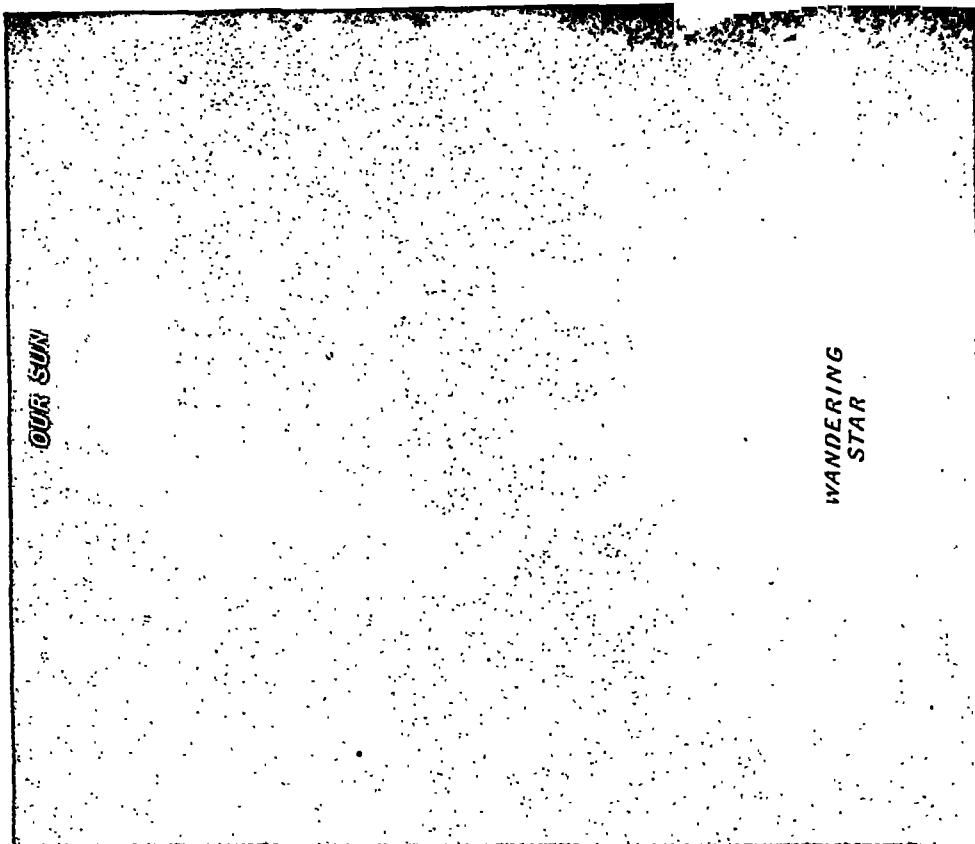
Courtesy of Royal Astronomical Society

although it has only one-eightieth of the mass of the Earth, raises substantial tides in the oceans which cover the Earth's surface.

If the Moon were replaced by a second Earth, these tides would be eighty times greater than they are, and in place of an average tide of thirty feet we should have an average tide nearly half a mile in height, which would inundate all except the highest land every twelve hours. Imagine that this second Earth, instead of being thirty times its diameter away from our Earth as the Moon is, were brought to within a distance about equal to the Earth's diameter. The conception of tides fails

utterly to explain what would now happen. A huge mountain of water some hundreds of miles high would travel round the Earth once every twenty-four hours, followed by a similar but smaller mountain of water at twelve-hourly intervals.

Mathematical analysis proves that the course of events when two gaseous stars approach fairly close to one another must be very similar. The main difference is that the stars have no solid unyielding surface over which tides can travel, so that their whole structure is battered out of shape by the gravitational pull of the neighbouring star. It is found that the less massive of the two stars will suffer

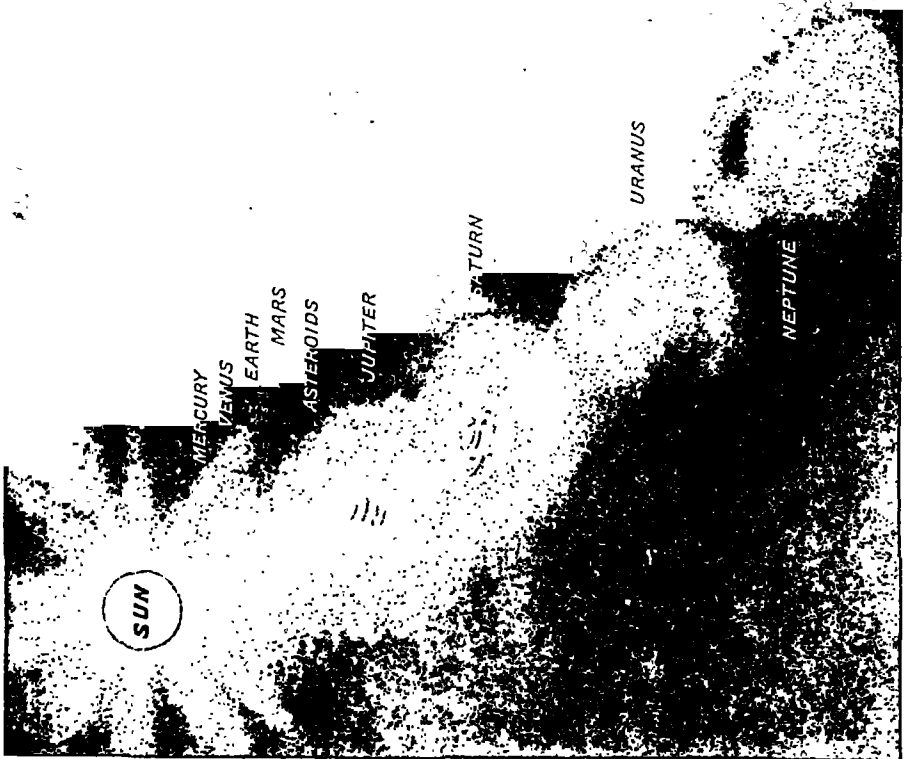


FIRST TWO STAGES IN THE COSMIC CRISIS WHICH ACCORDING TO THE TIDAL THEORY EXPLAINS THE BIRTH OF THE WORLD

The explanation of the birth of the world and the other planets, which to-day replaces the nebular hypothesis of Laplace, is known as the tidal theory. According to this process was not a matter of millions of years, but of a few months. It is thought that some wandering star about 2,000 million years ago approached near enough to our Sun, to raise two hummocks of gas upon its surface, just as the Moon causes tides in the sea; as the two bodies drew closer the nearer hummock became drawn out into a long arm pointing towards the wanderer. Here was the great crisis of solar existence.

FIRST TWO STAGES IN THE COSMIC CRISIS WHICH ACCORDING TO THE TIDAL THEORY EXPLAINS THE BIRTH OF THE WORLD

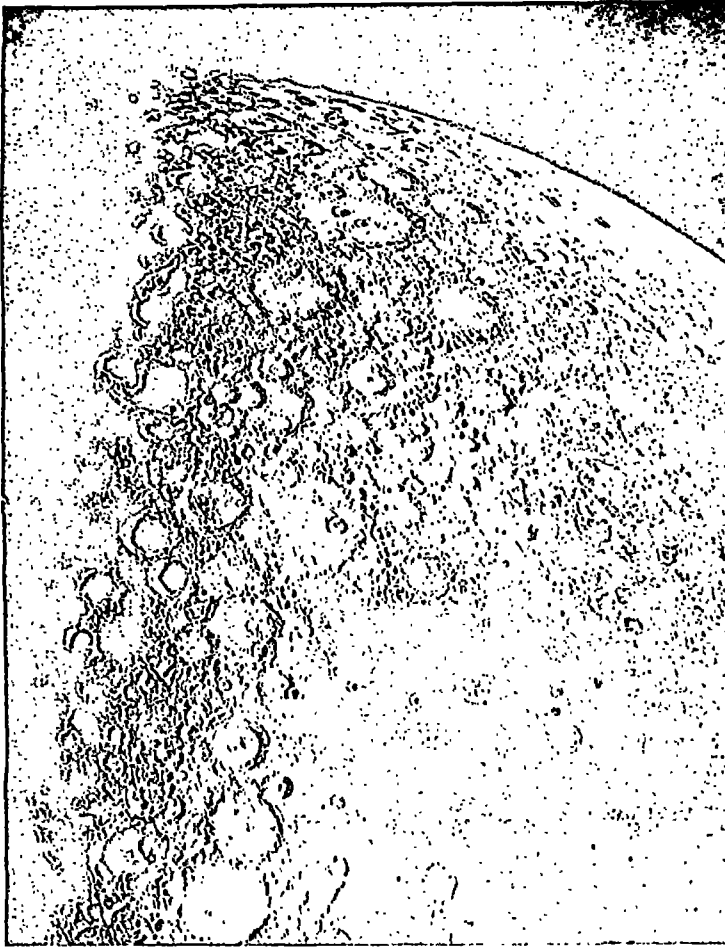
The explanation of the birth of the world and the other planets, which to-day require, but of a few months. It is thought that the Sun, after about 2,000 million years, approached near enough to our Sun to raise two hummocks of gas upon its surface, just as the Moon causes tides on the two, leading to the formation of the Earth and the Moon. There was the great crisis of solar existence.



HOW AN ARM OF GAS DRAGGED FROM THE SUN BY A WANDERING STAR CONDENSED INTO THE SOLAR SYSTEM

Had the path of the wanderer been slightly different the result might have been utter disruption or a head-on collision. But it passed on its way, and the arm of gas, becoming detached from the Sun, broke up into condensations like the nebular arms shown in the plate facing page 56. Finally these condensations formed the planets that we know, revolving round the Sun; though the smaller of them, perhaps, dispersed before solidifying. Thus the event which led to the formation of this Earth upon which we live came near to ending the independent existence of the Sun from which we derive our life.

Specially drawn by Siriven Bolton, F.R.A.S.



CAUSE OF OCEAN TIDES UPON THE EARTH

Here is a telescopic view of that familiar object which, on a small scale, gives an illustration of the tidal theory twice a day—the Moon. It is seen just half-full, and the portion shown stretches from the south pole (top) to the rim of the crater Hipparchus.

Courtesy of Royal Astronomical Society

wandering star, these arms are pulled more and more out of shape and, if conditions are favourable, one or both may become entirely detached from the parent star and break into drops, much in the same way as the gaseous matter in nebular arms has been seen to form into drops. According to the tidal theory of the genesis of the solar system, each of these drops forms a planet.

The tidal theory, in the form in which it has just been described, is generally accepted by astronomers as depicting the most probable method of birth of planets. The theory is quite recent, and cannot claim any sort of finality yet. It is, nevertheless, the only theory at present in the field which can claim to be described even as plausible, all other theories having been convicted of insuperable objections. It has survived no small amount of critical discus-

the more severely from the encounter. When the more massive star approaches sufficiently close, it creates very exaggerated tides on the less massive star.

At first these may look like ordinary tides, but as the other star approaches nearer, and its gravitational pull becomes more intense, these tides resolve themselves into two mountains of stellar matter travelling over the star's surface. Finally, a still closer approach changes these mountains into two long arms of gas which the star throws out from its surface; one, the longer one, towards the wandering star which is the cause of all the trouble, and the other, the shorter one, diametrically away from it. Yielding still further to the gravitational pull of the

sion with success and, as will appear later, it shows an ability to correlate and explain a large number of observed facts, such as entitles it to a great measure of confidence.

On the other hand, it has to be admitted that observational astronomy can bring no direct ocular evidence to the support of the theory. This is inevitable, and is an objection which must apply equally to all theories of the genesis of planetary systems. For, as has already been mentioned, planetary systems round other stars are too small to be seen in our present telescopes at all: no human eye has ever seen any such system except our own, nor ever will until either the size of telescopes or the sensitiveness of

photographic plates has been greatly increased. Moreover, even if this had been achieved, and we were in possession of telescopes and photographic plates far in advance of anything now at our disposal, a further obstacle would remain. If the tidal theory is true, the whole transformation of a simple star into a solar system of sun and planets is a matter at most of a few years, perhaps even of months.

In the whole of the millions of millions of years of a star's existence the great event happens at most once—for most stars not at all—and if it happens it occupies only a few years. A watcher must watch with extraordinary care to see it happening, and even then the chances are that he will fail through no such event occurring in his lifetime. There is a marked contrast between the birth of suns out of nebulae, a process which occurs on so majestic a scale that our telescopes enable us to study it with ease and with such slowness that we find innumerable examples of it at any moment, and the birth of planets out of suns, a process which is too small in scale, too rare in occurrence and too short in duration for us ever to hope to see it.

A still further contrast claims our attention. The tidal theory supposes the birth of planets to be in effect nothing but an intensification of

Birth of Suns and the process which causes Planets contrasted the ebb and flow of the tides along our coasts.

The birth of stars, on the other hand, arises from an intensification of the process which causes splashes of mud to fly away from a bicycle wheel in motion. If we are right in supposing spiral nebulae, suns and planets to form three successive generations in the process of filling the heavens with inhabitants, we might reasonably have expected a certain similarity in the births of successive generations; we might perhaps have expected the births of suns and of planets to have been as similar as the births of children and grandchildren in human life.

The essential difference, which causes the analogy to fail, is that children and grandchildren are of the same size at

their birth, while suns and planets are not. In actual fact the same agencies are at work when planets are born as had previously presided over the birth of their parents; but, as a consequence of a great difference in scale, they occur in different proportions.

Rotation, which caused the break-up of the original nebula into suns, must also be present when the suns give birth to planets; if there were

no rotation the embryo Tidal and planets would fall back Centrifugal Forces into the sun and could

have no independent existence. And tidal forces, which are the main agency in the birth of planets, must be present also at the break-up of a nebula into suns; it is probably the action of tidal forces which causes the matter ejected from a nebula generally to form two distinct arms, as in Figures 7 and 8, instead of coming off symmetrically in circles, as in Fig. 6; the two arms of the nebula are the precise analogue of the long arms drawn out of a star by tidal action, or again of the two mountains of water which we have imagined following one another round our Earth's surface. The scientist is well accustomed to cases in which different natural agencies assume importances which vary according to the scale on which phenomena take place. The flight of a golf-ball is different from that of a football, not because different forces are at work in the two cases, but because the same forces act in different proportions; the fall of a raindrop is different from either, although still governed by precisely the same forces.

Although the birth of planets appears to demand the presence of powerful tidal forces, and consequently the close approach of two stars, there is practically no room for doubt that a star can break up by rotation alone, tidal action, if it is present at all, playing an entirely subsidiary part. The final product of this process is not a sun surrounded by a family of planets, but a double star of the type already mentioned—two stars each about equal to half of their parent star, which eternally waltz round one another. Thousands of such systems are known in the sky and nearly half of the total number of stars

are believed to have broken up into binary systems in this way. Indeed these binary systems form the normal end of the chain of stellar evolution; solar systems such as our own are comparatively rare and something in the nature of freaks.

This is easy to understand. The fission of a single star into a binary can occur whenever the star is rotating with sufficient speed; it is in no way

Solar system a
Cosmic Freak

dependent on the presence of a neighbour. But the birth of a solar system can

only occur when a neighbouring star is very close at hand. We have already constructed a model of seven fruits which illustrates how rare these close approaches of stars must be. ✓ Exact calculation demonstrates that, with the stars moving as they now are in the neighbourhood of the Sun, in a period of seven million million years only about one star in a hundred thousand will approach near enough to another for the birth of a solar system to be possible, and even then there are odds of perhaps ten to one against a solar system actually being formed. If we suppose the average star to have existed for seven million million years, which is about the age of our Sun, this calculation suggests that only about one star in a million can be surrounded by planets. Thus the whole colony of some 1,500 million stars, of which our Sun forms a member, can only contain some 1,500 systems similar to that of the Sun.

This calculation probably errs in the direction of over-estimating the odds against the formation of solar systems. When a star is in the earlier and more tenuous stages of its existence, it is far more susceptible to the tidal influence of other stars than when it has become a compact and comparatively small body like our Sun; it both offers a bigger target, so to speak, to other wandering stars, and its flimsy structure is more easily pulled out of shape. Also it is probable that in earlier ages, especially immediately after their birth, the stars were more closely packed than they now are, in which case close encounters of pairs of stars must have been of more frequent occurrence. But after all allowances have been made it seems impossible that solar

systems should be quite common objects; the total number in our colony of stars must almost certainly be reckoned in thousands rather than millions, and there are probably not many thousands.

When it was first realized that every point of light in the sky represented a sun, similar in its main features and characteristics to our own, it was natural to assume by analogy that the reason of its existence was the provision of light and heat to the inhabitants of planets circling around it. The calculations just mentioned call a halt to such speculations. They suggest that only very few stars perform this function; most stars have no planets in attendance on them, and are themselves totally unsuited to be the abode of life. For a sun to support life is the exception; the normal sun eternally radiates energy away into endless space without affecting life of any kind. Life must be much more rare, must form far less of the total of the universe and enter less into the scheme of things, than was thought half a century ago. It is not altogether inconceivable, although very far from probable, that our own Earth may be the only abode of life in the whole universe.

We have seen how, when the tidal arm of matter first became detached from our Sun, it broke up into separate condensations, each of which

formed a planet. From the mode of its formation this arm of matter would

Cigar-shape of
the tidal arm

necessarily taper off at both ends and be thickest in its middle parts; it must have been somewhat cigar-shaped. We should expect more massive planets to form out of the central parts than out of the ends of this tidal arm. This is confirmed by the present order of the planets, which may be diagrammatically represented as in the upper of the two illustrations opposite. The largest and weightiest of the planets, Jupiter, is near the middle, and the planets taper off in size as we pass to either end.

By surrounding the planets in the diagram with a hazy outline, we can reconstruct, in imagination, the cigar-shaped filament as it was when it was first drawn off from the Sun by the tidal pull of a near star. The smaller planets were too small



SUGGESTED REASON FOR THE DISTRIBUTION OF PLANETARY MASSES

Confirmation of the tidal theory of planetary origins is afforded by comparing the masses of the planets in their order from the Sun. It will be seen that they fall roughly within an outline that represents the cigar-shape of just such an arm of gas as might have been dragged from the Sun by the pull of a neighbouring body. The figures below the planets give the numbers of their satellites.

to survive for long as spheres of gas, and so must have first liquefied and then rapidly solidified. The larger planets were under no such necessity, and indeed Jupiter and Saturn are gaseous to this day.

We have spoken throughout of the inhabitants of the sky as forming three generations—nebulae, stars and planets—but their genealogy extends to a fourth generation, the satellites of the planets. Since the time when Galileo first noticed that the systems of Jupiter and Saturn formed miniature replicas of the system of the Sun, there has been little room for doubt that the births of these minor systems must have been after the same manner as that of the main solar system. The tidal theory is found to give a very satisfactory account of the origin of these satellites.

✓ When Jupiter first came into existence as an independent planet he found himself already under the tidal influence of a far larger mass, the Sun, and possibly also of the wandering star which was

the origin of his being. Moreover, as his orbit was probably far from circular, its nearest approach to the Sun may have been so near as to tear him to pieces, just as the Sun had previously been torn to pieces by the tidal pull of the still larger wandering star. It is, then, natural that he should be surrounded by a system of satellites.

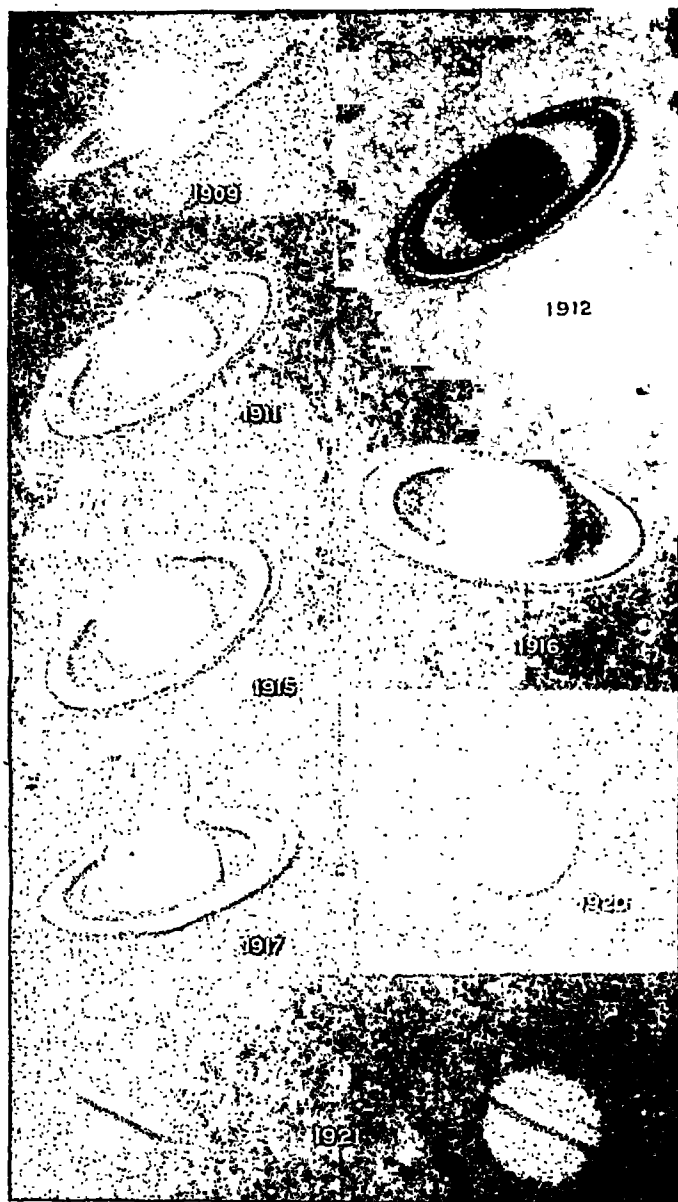
Indeed, it might be supposed that the process could go on for ever, to generation after generation; that the satellites under the tidal influence of Jupiter should give birth to sub-satellites and so on ad infinitum. ✓ Saturn's rings, which consist of enormous numbers of extremely minute satellites, are generally supposed to have been brought into existence by some such process, and the asteroids, which form a great swarm of minute planets, may be a second instance of the process.

✓ But in general the endless repetition of the birth-process is prevented by the circumstance that only masses above a certain size hold together gravitationally



THE VAST BULK OF JUPITER SEEN WITH FOUR OF HIS NINE MOONS

Just as the gravitational pull of a wandering star dragged the planets from the Sun, so the same star—or more probably the Sun itself—may have acted upon these offspring of the second generation to form a third generation of satellites. Jupiter, which is the largest of our family, has nine. Inset is a comparison of its bulk with the Earth; but its weight is not greater in the same proportion.



SATURN SEEN IN VARIOUS POSITIONS

The rings of Saturn which so puzzled astronomers—they appeared like handles through Galileo's little instrument—are now thought to be composed of countless tiny satellites, and may have been formed by the break-up of several larger ones. They are in accordance with the tidal theory.

Courtesy of Lowell Observatory

Apart from Saturn's rings and the asteroids, very few bodies are known whose diameter is less than 600 miles, which is about the limit below which masses of gas or liquid would disperse into space.

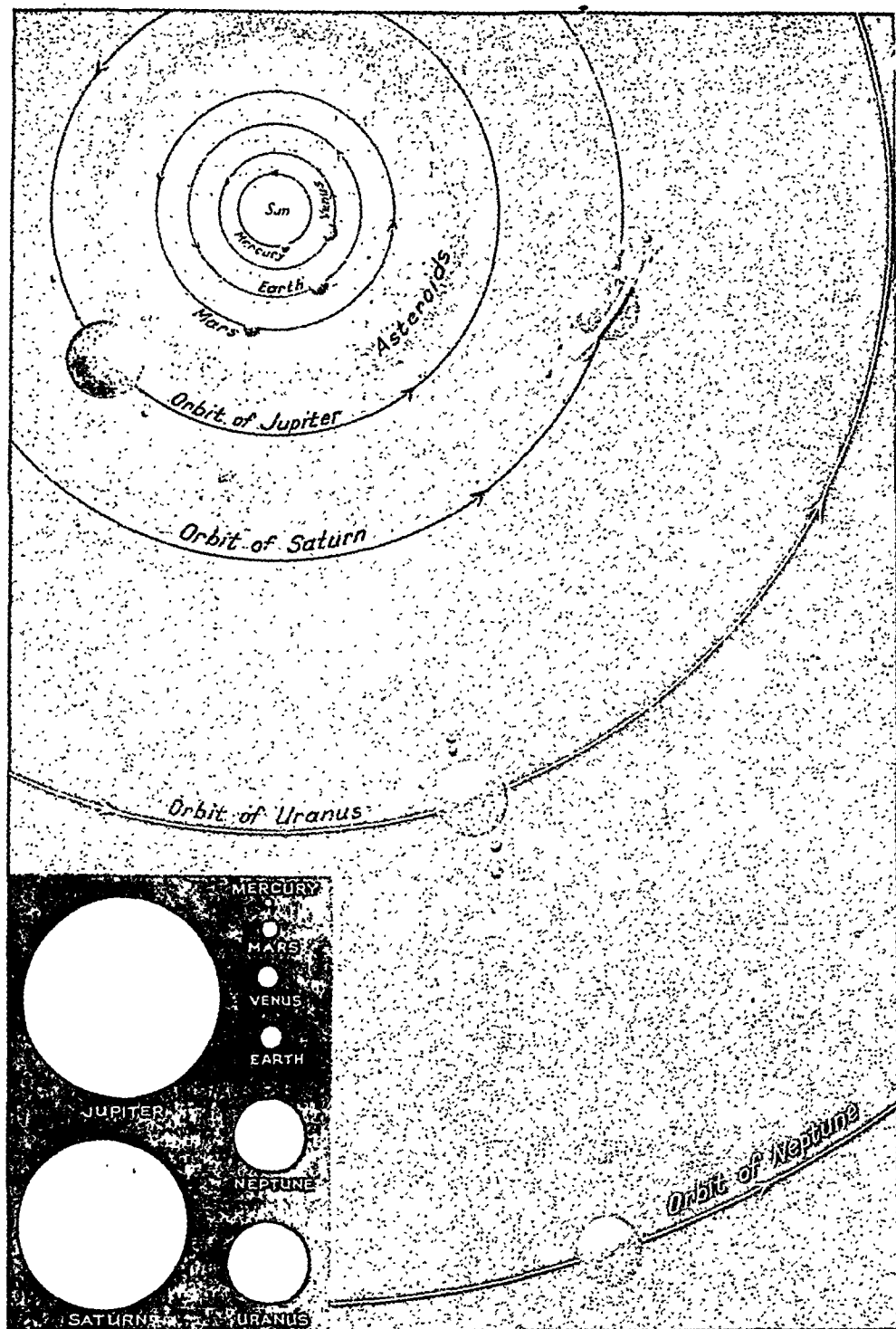
Theoretical considerations show that an entirely gaseous planet ought to give birth tidally to a large number of small satellites, while the satellites of a liquid planet, if they occur at all, ought to be few in number and larger in size, relative to the size of the planet, than those born out of a gaseous parent. Jupiter and Saturn, which are even now in the gaseous state, have presumably always been so. Thus it is entirely in accordance with the requirements of the tidal theory that these large planets are found to be attended by large numbers of small satellites.

✓ But we have seen that the planets nearest to and farthest away from the Sun—those which were formed out of the two ends of the original filament—probably cooled so rapidly as to become liquid immediately they were born, so that these ought, according to the tidal theory, to be surrounded by fewer but relatively larger satellites. This is found to be so. The number written under each planet in page 73 indicates how many satellites it possesses; we see that this number is greatest for Jupiter and Saturn and tails off in each

direction. The prediction as to size is also fulfilled; the satellite most massive compared with its primary is our Moon.

Piecing all the evidence together, we may be fairly certain that our Earth must have attained a liquid or partially liquid state either during or immediately after its birth, and that while it was in this state it gave birth to the Moon

unless they happen to be in the solid state. A puff of gas disperses rapidly into space; a drop of liquid is evaporated within a time which is very short when judged by astronomical standards; the only way in which small masses either of gas or liquid can hope to persist through times of astronomical length is by solidification almost immediately after birth.



OUR FAMILY OF WORLDS IN ATTENDANCE ON THEIR PARENT SUN

It is in this order that the planets—that Earth upon which the drama of Man's history is being played out and its nearest neighbours in the wastes of space—swing endlessly round the Sun. Neither their orbits nor the Sun are drawn to scale, for even with the latter so disproportionately small, the Earth should be twenty inches away; but the inset gives the relative sizes of the planets.

under the tidal influence, probably of the Sun, although just possibly of the wandering star which had originally been responsible for the birth of the Earth itself. The evidence of geology and of radioactive rocks fixes the date of these events at something like 2,000 million years ago, in round figures.

// This period is so small in comparison with the total age of the Sun (about seven million million years) that the Sun cannot have been very

The Birth of the Planets

different when our Earth was born from what he is at present. We picture the Earth and her sister planets cooling down, rapidly liquefying and finally solidifying. In the earliest years of their existence satellites are born and these, if not originally liquid, must either liquefy and solidify at once or else dissipate into space, leaving no record of their existence behind; only those survive which become solid almost at once.

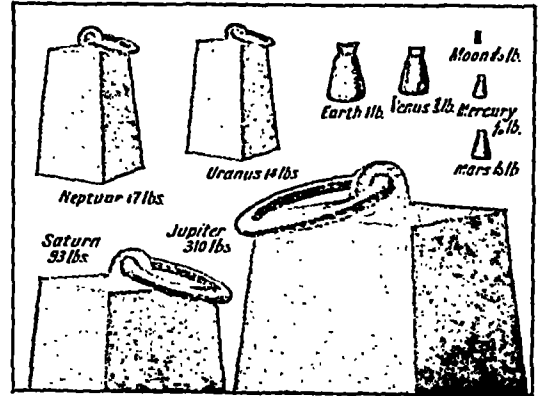
✓ Our Earth appears at first as a liquid or plastic globe with its single satellite revolving round it. The two masses are much nearer together than they now are, the Moon consequently distorting the Earth's surface to a very appreciable extent. ✓ As the plastic Earth becomes more solid the tides raised on it by the Moon no longer travel over its surface but form a standing feature on this surface and, as the Earth finally solidifies, become perpetuated as tablelands, mountains and ocean beds. The circular Pacific Ocean perhaps provides the clearest tangible evidence of the action of the Moon upon the plastic Earth, although the once cherished view that the Pacific basin marks the place from which the Moon was originally scooped out is hardly tenable to-day. Tidal forces must inevitably have resulted in the Moon receding farther and farther from the Earth.

In the meantime the supply of heat which the Earth brought with it from the Sun is being radiated away into space. The Earth cools down and, as it does so, plastic masses become solid rocks and the irregularities of the surface are petrified into a permanent record; vapours condense into liquids and the oceans are formed; the more permanent gases alone

remain uncondensed and constitute an atmosphere. Evaporation and condensation, rain and storms occur, rivers spring into being and disintegration, attrition and sedimentation of the Earth's surface begin: the stage is being prepared for the next great act of the drama, the appearance of life.

Although we are a degree less sure that this is the true course of events than we should be if it were possible to study the birth of other worlds through our telescopes, yet theoretical considerations leave very little doubt that the birth of our Earth took place much in this way. Some rather suggestive consequences follow.

✓ Leaving aside all conjectures as to the past state of the stellar universe, calculation suggests quite definitely that our



MASSES OF THE PLANETS

Allowing the Earth a weight of one pound, this drawing gives the relative weights of the Moon and the other seven planets on the same basis.

A better scientific term for weight is 'mass.'

✓ colony of some 1,500 million stars can hardly be producing solar systems at present at a greater average rate than one every 6,000 million years. The age of our particular solar system is, however, as we have seen, almost identical with the time that has passed since the solidification of the Earth, which is only some 2,000 million years. Thus there is a large chance that the youngest solar system in the whole colony of stars is our own. We cannot, of course, be sure; in a village in which babies are born at an average rate of one a week, the baby which was born the day before yesterday is in all probability the youngest inhabitant, although nothing less than a house-to-house visitation could establish this as a certainty.

In the same way it seems likely, although it cannot be stated for certain, that the planets attending our Sun are the youngest in our colony of stars—perchance the youngest in the whole of space.

A variant of this calculation is of still greater direct interest to us. Civilization on Earth is, let us say, 10,000 years old. If solar systems come into being at the rate of one every 6,000 million years, and if each contains ten planets suitable for life and destined ultimately to be the abode of life, then civilizations come into existence at an average rate of one every 600 million years. This gives a very large probability that our terrestrial civilization, with only 10,000 years to its credit, is the youngest in the whole colony of stars. It is likely to be the youngest in the whole of space. Of all the planets in the sky the inhabitants of our own are probably the most inexperienced in civilization.

This conclusion, from which no escape seems possible, leads to at least one reflection of practical interest. We are apt to think of ourselves as living at the end of time. The feeling has perhaps been intensified by recent events on our planet, but it has been common to all ages; it doubt-

less expresses an illusion resulting from past time being known to us while future time is unknown.

The Lesson of Astronomy

The 'end of time' feeling does not obtrude in epochs of what is commonly described as rapid progress, but when progress is thought to be in the wrong direction, from good to bad or from bad to worse, it comes bringing in its train pessimism or despair: little matters, the end of all things is at hand.

A review of events on the astronomical scale—a study, so to speak, of large-scale time-maps—puts such reflections in their proper perspective. We are not living at the end of time but, as far as our Earth is concerned, at the very beginning; our lot is to live through the fresh glory of the early morning, not to watch the inexorable lengthening of the evening shadows. As the youngest civilization in the sky we know least and have the most to learn. Almost endlessly the vista of future ages stretches before us in which the race, if not the individual, may

learn all there is to know and perfect itself accordingly. Present disharmonies on our planet are not to be compared to the pains which presage senile decay; compare them rather to the pains of the infant cutting its first teeth. They do not proclaim the end of the life of the race, but rather the beginning of the adjustments necessary for the prolongation of this life beyond its infantile stage. The human race, having lived up to now off the far from inexhaustible stores of wood, coal, oil and minerals which nature had stored up in the Earth, is in the position of an infant which has lived only upon its mother's milk. It must learn to fend for itself, and the process may be troublesome.

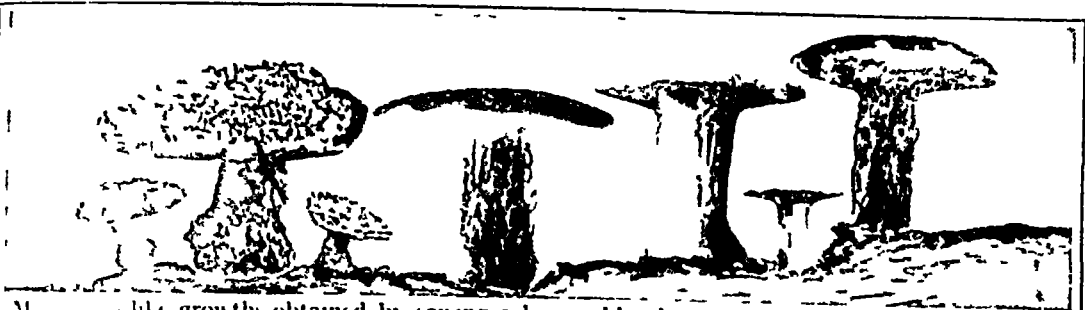
An extra-terrestrial visitor, surveying our civilization from an objective standpoint, would doubtless notice many symptoms of our extreme infancy. He would note Our World is that we have not yet surveyed the whole surface of our diminutive planet; still less have we investigated and classified its resources. We have not yet been to the tops of its highest mountains, neither have we descended more than a few thousand feet into its body. Disease and death still ravage us almost unchecked. We have not yet attained to constancy in the numbers of our populations, and, apart from the crude and cruel mechanisms of famine, war and pestilence, we have no social machinery for keeping these numbers within the limits necessitated by the size of our planet.

✓ So far from approximating to the proverbially happy state of having no history, our history grows ever more intense and life ever more strenuous; the race is more restless than ever before and the changes in its social structure more frequent. Out in the far depths of space are other, older planets whose inhabitants, having long ago passed through their troubled periods of growth and adjustment, have now no racial cares beyond the continued improvement of their lives; we may envy them, but in the present state of science we cannot hope to learn from them. We can learn only from our own past failures; it is for this that history exists.

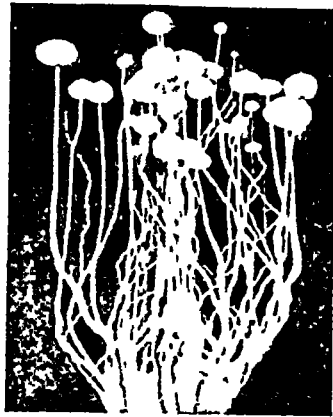


HOW GEOLOGY AFFECTS THE DAILY LIFE OF MILLIONS IN GREAT BRITAIN

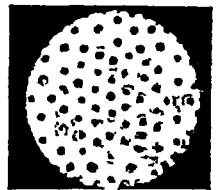
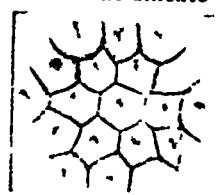
In the British Isles the distribution of population varies from place to place (see page 86). It is densest on the younger secondary strata of the south-eastern districts, such as the clay of the London basin, and on the older secondary rocks of the coalfields with their associated deposits of iron. In the areas of primary rocks, such as the Scottish Highlands, the population is scanty.



Mushroom-like growths obtained by sowing calcium chloride in a solution of an alkaline silicate



Arborescent calcium growths



Cells grown by diffusion in gelatin



Beautiful forms imitating water-weeds and shells the former bear coloured capsules on each stem

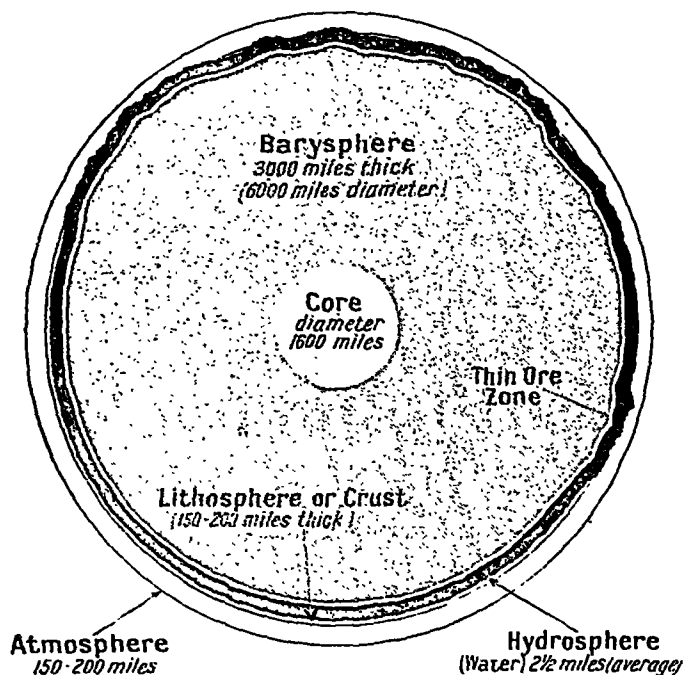


Adding sodium sulphate to the silicate solution results in a wonderful mimicry of coral

HOW SEAWEEDS, SHELLS AND FUNGI CAN BE MIMICKED IN THE LABORATORY

Crystals (see page 88) are often quoted as displaying some of the functions of life. What are called osmotic growths offer a far more exact parallel. By sowing granules of certain chemicals in certain solutions Dr Stéphane Leduc of Nantes has produced these growths, which not only mimic living forms in an amazing way, including cellular structure, but even reproduce functions such as absorption of food from without, internal metabolism and excretion of waste products.

Photos by courtesy of Dr Stéphane Leduc



THE ARCHITECTURE OF THE EARTH

Five shells surround the Earth's core, which, according to scientific deduction, is either gaseous or liquid. The innermost shell, the barysphere, is composed mainly of iron and nickel, while in the ore zone the metal is mixed with the earthy minerals that floated up to form the crust, or lithosphere.

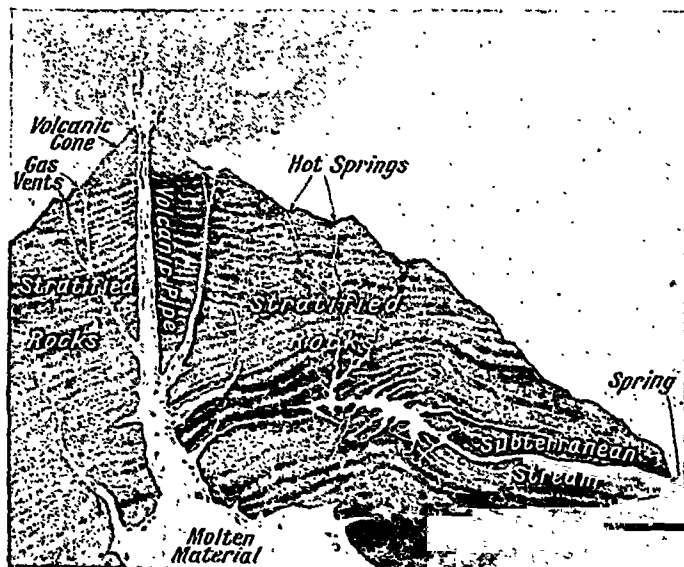
oldest of the three is the Era of Ancient Life, the Palaeozoic; the Era of Middle Life is the Mesozoic; the Era of Recent Life, or Cainozoic, includes the present time. The probable relative durations of these three eras are shown in the chart facing page 96.

In the era before the Palaeozoic the world was inhabited only by archaic organisms, and it is sometimes called the Archaean or Archaeozoic Era; though these terms are used in such different senses that they are ambiguous. It was the era of the first life on the Earth; so adopting Plato's term for the primeval, we may describe it as the Pampalaeozoic or Primeval Era.

The older Pampalaeozoic rocks form the bulk of the Earth's crust and are the foundation on which all the later rocks rest. These early

rocks give no direct evidence as to the geographical conditions on the Earth's surface during their formation, for they were either formed deep underground or have been completely altered in later epochs. The most typical of these rocks were formed at a high temperature and under great pressure deep below the surface. They are associated with beds of altered limestone, sandstone and clays, which indicate that even at that early time the general conditions which now exist on the Earth already prevailed. Further, the thick beds of limestone and the seams of graphite, which were probably derived from primitive plants, suggest that even at that date the seas were occupied by swarms of animals and plants.

During this first era the Earth was much larger and less compact, and its crust thinner than it is now. The Earth was then contracting comparatively rapidly, as its materials were being welded by heat and



VENT PIPES IN THE EARTH'S CRUST

The water and gases contained in the rocks of the Earth's crust find several ways of escape to the surface. Volcanoes, gas vents and hot springs provide outlets for gases and hot water, while the stratified rocks are drained by subterranean streams issuing forth as springs from between exposed strata.



ROCKS FOLDED AND WRINKLED IN THE ERA OF PRIMEVAL LIFE

The Earth was contracting comparatively rapidly during the first era of its history, the Pampalaeozoic or Primeval, and the rigid crust crinkled as it was forced into smaller space by the shrinkage of the barysphere. Primeval rocks, laid down as horizontal beds, became tilted and folded like the black slates and limestones seen here, and this process served to thicken and strengthen the Earth's crust. The size of the geological hammer on the left indicates the thickness of these strata.

Photo, Geological Survey and Museum

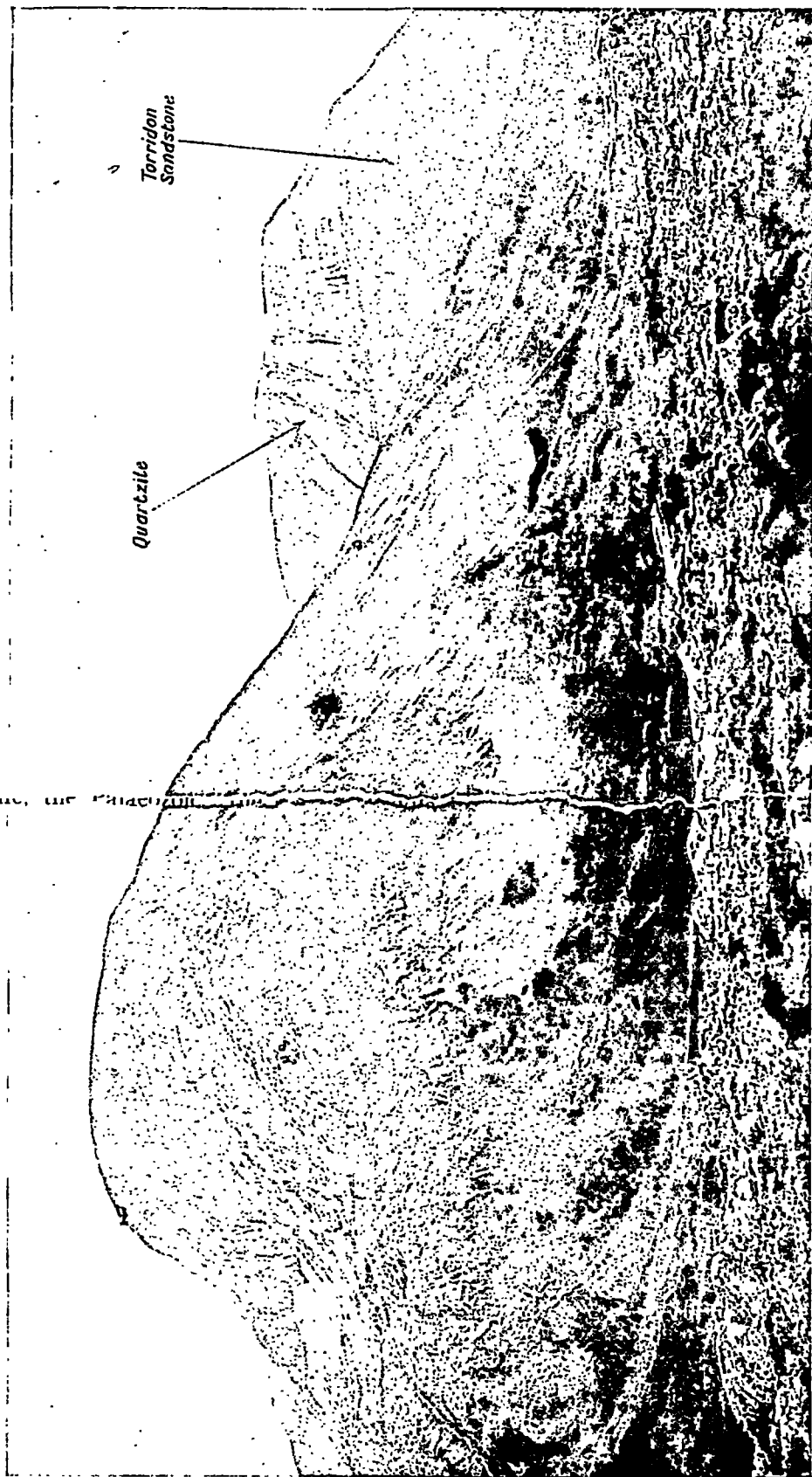
pressure into the compact mass of the barysphere. The skin of an apple which shrinks as the pulp dries and shrivels is thrown into folds; so the rigid crust of the Earth is wrinkled and folded when it is forced into a smaller space by the shrinkage of the matter in the interior. Hence all the primeval rocks that were laid down as horizontal beds on land or sea have been since disturbed and tilted.

The later rocks are also tilted; but with them violent tilting is restricted to belts in the crust, whereas in the older Pampalaeozoic Era the whole crust was corrugated by the contraction of the interior. The crust, however, was gradually thickened by folding, by the addition of layers below through solidification, and by deposition of beds of sediment on the surface. The crust, therefore, became stronger and more stable; and some rocks of the later part of the first era are so little altered that they give clear evidence of the geographical conditions on the Earth's surface when they were formed.

The most typical rock of this kind is a coarse-grained red sandstone which forms

extensive areas in North and South America, Scandinavia, India, Australia and Africa, and is conspicuous in north-western Scotland. It there forms the Torridon Mountains, from which this division is known in Britain as the Torridonian. The grains in the Torridon Sandstone are often beautifully rounded and polished like sand which has been rolled about by the wind in modern deserts. Many of the pebbles in the sandstone have flattened straight-edged surfaces like the facets of a gem. It was sand, blown against the pebbles by the wind, that cut these surfaces. Such primeval sandstones were formed under desert conditions, and the materials were moved and sorted by the wind.

The Torridon Sandstone in the north-west of Scotland rests upon an old undulating land surface, and it has filled up the valleys and buried the pre-existing hills just as desert sands now smother a district by occupying the hollows and covering the ridges. Wind and rain are now wearing away the Torridon Sandstone beside lochs Marce and Assynt, and are again exposing the fossil valleys and hills which have there



MOUNTAINS IN NORTH-WESTERN SCOTLAND THAT SHOW ONE OF THE MOST TYPICAL OF THE PRIMEVAL ROCKS

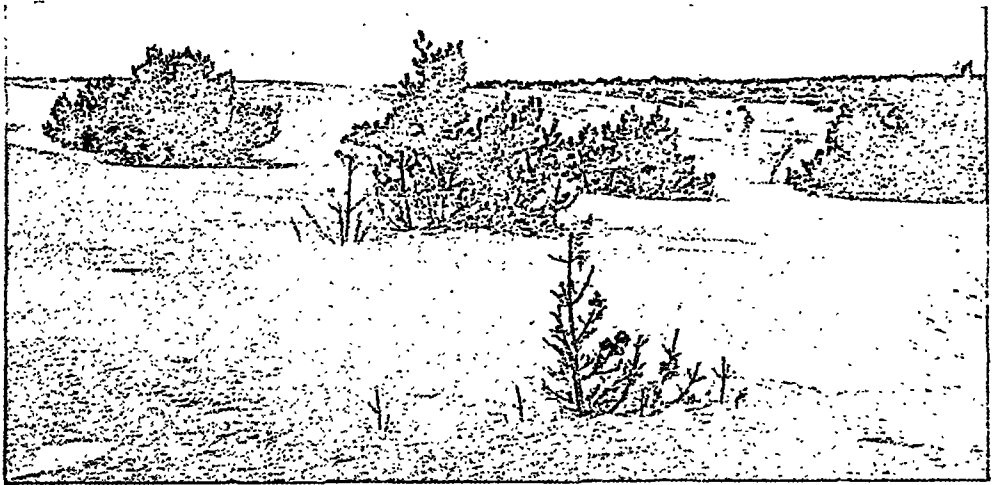
The gradual erosion by weather of mountain-sides in north-western Scotland has shown that the Torridon Sandstone of which they are largely composed rests upon an older land surface. To the left of this photograph we see the steeply tilted beds of Torridon Sandstone on Ruad Stac Beag, to the right Ruad Stac Mor with its quartzite crown above gently inclining sandstone beds; both are near Loch Marce. This same coarse, red sandstone occurs extensively over Europe, Asia, and America, and supplies evidence about the geographical and climatic conditions that obtained on Earth many million years ago.

Photo, Geological Survey and Museum

lain buried for a thousand or more million years. These sandstones show that the forces of the weather at the beginning of geological time were similar in strength and direction to those of the present time. Hundreds of wind-cut pebbles may be seen lying on the surface exposed by the crumbling of the sandstone; they are still in their original position; and the direction of the sand-cutting shows that the prevalent wind then blew in the same direction as it does at the present day. The winds moved sand grains of the same size as those which are now blown forward, so that the meteorological forces were

then in existence is proved by the fact that some grains of phosphate of lime containing grooves or canals, that must have been caused by organic agencies, have been found in this sandstone beside Loch Broom in north-western Scotland.

Evidence of early life on a larger scale is supplied by the thick sheets of limestone which occur among the primeval rocks in many parts of the world. Now it is true that some limestones are formed by purely chemical processes, and that, owing to the alteration which the primeval limestones have undergone, the evidence whether they were deposited chemically or



SAND-DRIFTS OF TO-DAY SIMILAR TO THOSE OF PRIMEVAL TIMES

The direction of the drift of this sand at Maviston in Scotland is that of the prevalent winds—from west to east. That fir-trees partially buried by it are still alive shows the rapidity of its advance. Scratches made by drifting sand on pebbles embedded in Torridon Sandstone indicate that as far back as Pampalaeozoic times the prevalent wind in Scotland had the same force and the same direction.

Photo, Geological Survey and Museum

similar in strength to those acting at the same place to-day.

The great difference between the surface of the earth then and as we know it was due to the absence of turf. The rock and soil were not protected from the attack of rain and wind and water by a mantle of plants. Accordingly the loose, shifting sands which characterise the desert of to-day then covered the whole land. The prevalence of shifting sand does not indicate that a dry climate was then universal, but that the loose earth was not held in place, and the rocks were not protected by a carpet of vegetation.

The Torridon Sandstone has yielded no definite fossils, but that living beings were

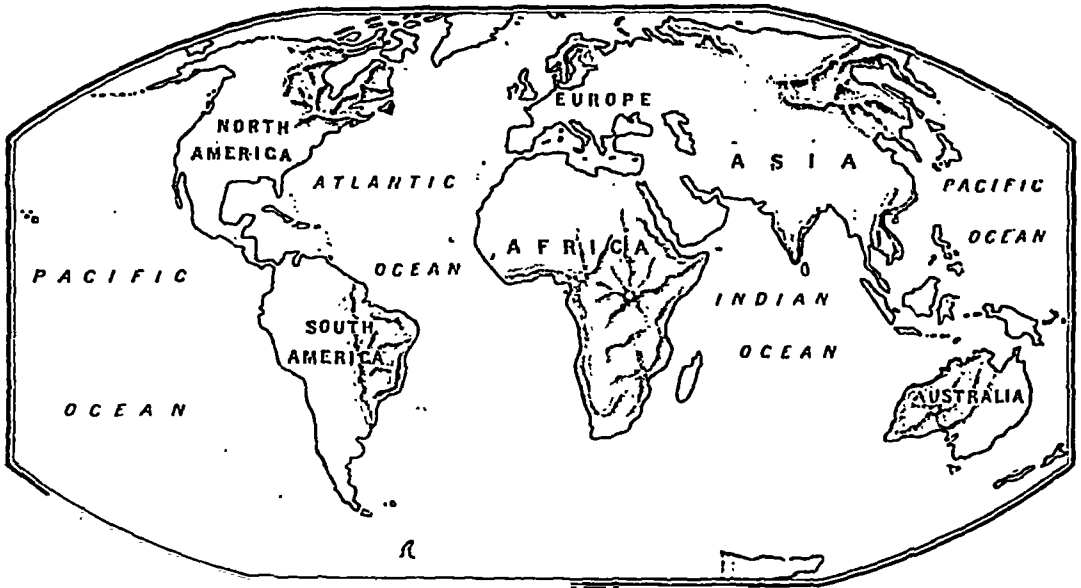
by the action of life has been destroyed; but this evidence exists clearly in other cases. Most limestones are undoubtedly formed by animals or plants, and the Pampalaeozoic limestones agree in arrangement with those formed by organisms at later geological dates.

The Earth before the Pampalaeozoic Era must have been intensely hot and was, perhaps, molten. Hence it was natural at first to think that when the Earth was young its climate must have been uniformly warm and moist. Nevertheless, the oldest known rocks afford clear evidence that during their deposition glaciers existed in parts of the world which are now too hot for them. The hills in South

Australia that rise behind Adelaide and extend northward towards Lake Eyre contain beds of conglomerate with huge ice-worn and ice-scratched boulders like those carried down mountain sides by modern glaciers. These South Australian conglomerates were deposited by ice as long ago as the Primeval Era; yet they actually extend into the tropics. Glacial deposits of about the same age occur in central China in part of the river basin of the Yang-tse-Kiang, a region which now has a hot, tropical summer.

adjacent parts of Siberia, the peninsula of India, equatorial Africa, Brazil and Western Australia are other coigns. The primeval rocks, in addition to forming these vast blocks, occur on the surface in long strips like that on the south-eastern coast of China, and in the axis of many mountain chains.

The formation of fold-mountain chains helped to prepare the world for Man in many ways. The mountains provided steep slopes down which water ran swiftly to the sea, and carried with it rock debris



VAST MASSES OF ROCK THAT FORMED THE PRIMEVAL WORLD'S CORNER-STONES

These vast masses of primeval rock were of the greatest importance in the building of the world. They have controlled earth movements, and (as we see by comparing this map with that in the opposite page) the courses of the mountain chains of modern times, in some cases forming the axes of them. Throughout geological time these primeval highlands have seldom been beneath the sea, which may be realized by a careful comparison with the maps in the plate facing page 96.

The primeval rocks form the foundation on which all the later rocks have been deposited. They are exposed at the surface in vast, massive blocks, most of which have remained above sea level throughout geological time. These blocks, or coigns, form the world's corner-stones, which have conditioned earth movements and the course of mountain chains in later times. The coigns of primeval rocks include some of the great existing highlands and uplands: one of them forms Scandinavia and Finland, and the Scottish Highlands were once a part of it; Labrador with the adjacent parts of Canada and the United States is another. Manchuria with the

which was laid down on the lowlands as new rocks. The mountain uplifts raised rock rich in lime and alkalis into positions subject to rapid weathering and decay; and thus stores of plant foods were set free to re-fertilise the lowland soils. The mountain folding was often followed by volcanic eruptions, which built up hills of lava and tuff and spread through the air layers of finely pulverised dust. These volcanic materials are usually rich in plant foods; and their decay under the action of the weather gives rise to exceptionally fertile soils.

The folding and tilting of the crust also exposes at the surface a great variety of

rocks and useful minerals, including the clays and limestones of the younger beds, the coals and ironstones of intermediate ages, the slates and ores of the older rocks. Igneous rocks (produced by volcanic agency) often occur in the core of the mountains and in sheets included in the younger rocks on their flanks.

The world had to undergo a long series of changes from its original simple structure before it could become the home of Man. The development of what we regard as a civilized community is only

decomposing vegetation, they begin to crumble and decay. The rock debris due to these processes is washed down the hillsides, and spread at their feet as beds of rain-wash or carried farther away by streams and rivers. As the rivers reach level country and their currents become less swift, the sediment they carry is deposited in the quieter parts of the channel or on the adjacent plains after floods.

The larger pieces of stone make beds of gravel and the finer material sheets of



HOW TIME HAS AFFECTED THE MOUNTAIN RANGE OF TO-DAY

The formation of mountain ranges helped to prepare the Earth for man. The primeval rock masses were constantly eroded by rain and wind, and this process was considerably expedited by the continual upheavals to which they were subjected, since these exposed new surfaces to the weather. The debris washed down the slopes and the volcanic material spread abroad by eruptions formed soil and regularly re-fertilised it. For the formation of modern mountains see further in page 110.

possible in a country of varied rocks. Those on the original surface of the earth would all have been of the kind which are known as primary, because their constituents are used as rock material for the first time in geological history. These primary rocks are formed directly by the solidification of molten matter. They are of two chief kinds—those formed deep below the earth's surface, such as granite, and those, such as lavas, which solidify on the surface.

When rocks are exposed to the action of water, rain and wind, and of changes of temperature, and to the attack of the gases in the air and of acids set free by

sand and clay. Sand consists of grains large enough to be recognizable by the naked eye, whereas in mud and clay the particles are so minute that the material appears uniform to the eye. The carbonate of lime dissolved in river water may be precipitated by some chemical or organic change, in layers or as grains which when cemented together form the limestone discussed above. The loose materials are ultimately cemented into secondary rocks, which are so called because their constituents are used as rock for the second time, having already occurred as the material of primary rock. Secondary rocks form the bulk of the upper part of the

Earth's crust, the most abundant kinds being sandstones, clays, shales and limestones.

The primary rocks as a rule are hard and resist weathering and the attack of rain and rivers, so that they stand up as hills and highlands. The loose material formed by their decay is washed down or blown away and deposited as secondary rocks on the neighbouring lowlands. Maps of the distribution of population show that as a rule people avoid primary and hard crystalline rocks in favour of the younger secondary rocks (see map in page 78).

A long period was required after the solidification of the crust for the formation of the varied secondary rocks and earths needed by Man. They

Man's debt to serve many useful pur-
Secondary Rocks poses. Most sands, owing to the hardness of their grains, can be used for polishing and grinding. Pure sands, of which the grains have been thoroughly sorted by water or wind, are used for the manufacture of glass; as they resist great heat before softening or melting, they are also used for making fire bricks and, mixed with suitable binding material, for the moulds in which metals are cast. When grains of sand are cemented by natural means they form sandstone, which is useful for building material as the stone is generally durable and yet easily worked. Porous sandstones and beds of sand act as reservoirs of water; they hold large stores of underground water which collect during wet seasons and escape gradually during dry weather. These waterlogged sands and sandstones may therefore discharge a continual supply from springs and wells.

Clay consists of minute particles, is usually plastic and can be moulded when mixed with water. By heating, it can be baked into bricks, pottery or porcelain, according to its composition. The compactness and denseness of clay render it impervious to water; hence if clay lies beneath sandstone the water cannot drain downward; the clay then acts like the floor of a reservoir and holds the water in overlying porous rock.

Water percolating through permeable material dissolves the soluble constituents, which are re-deposited when the water

evaporates or passes under different conditions. The iron-bearing grains or thin films of iron oxide to which most rocks owe their colour may be dissolved and deposited in a concentrated form as ironstone or iron ore. If ordinary sand is dissolved the material may be deposited as nodules or veins of flint or chert which, owing to their hardness and the sharpness of their broken edges, provided primitive man with his most useful tools.

If Man, or any of the higher animals or plants, had been introduced to a previously lifeless world, they would have found existence there impossible, for their necessary food and soils require the long-continued action of many simpler organisms. When life first appeared on our Earth and how it developed here may perhaps never be discovered, for the evidence may have been completely destroyed.

Lord Kelvin suggested that life was first brought to the earth by a spore lying in a crack in some meteorite; but that suggestion merely refers the difficulty to another sphere. No known heavenly body is, so far as we know, more suitable for the development of life than the Earth. Another way of avoiding a solution of the problem is by the assumption that the distinction between the living and the dead is absolute, and that life can only have been formed at a definite moment by a direct creation.

The fact that no satisfactory definition has been framed which separates living and non-living materials suggests that there is no absolute difference between them. The de- What separates
finition given by George Life from Death?
Henry Lewes represents
life as the property by which an individual may undergo great changes in composition and structure and yet retain its identity. During the growth of the human body, for example, the material is constantly replaced and the structure altered; yet the individual remains the same. According to this definition some of the more complex crystals must also be regarded as having life, for during their development they undergo changes in composition and structure, and yet each crystal retains its identity.

In the absence of a more satisfactory distinction by definition the differences between living and non-living matter may be best realized by considering the properties which are regarded as essential to life. Professor W. A. Osborne, of Melbourne, mentions six essential characters; but two of them—the power of self-defence against other organisms, and memory with its product intelligence—would naturally not have been possessed or required by the first living matter. A third character, the power of adaptation to change in environment, would not have been essential if, as is probable, life developed when the surrounding conditions underwent only insignificant changes. The remaining characters—the absorption of energy, the power of repairing and renewing tissues, growth and reproduction—are possessed by various types of crystalline matter.

The most obvious distinction between living or organic and the common kinds of non-living or inorganic matter depends on chemical composition. Living material consists of protoplasm, a complex substance in which are found the elements carbon, hydrogen and oxygen, combined with a little nitrogen and minute proportions of phosphorus, chlorine, sodium and a few other less important elements.

The chief constituent of protoplasm is a compound of carbon, hydrogen and oxygen in the proportion present in such materials as starch, which

are known as carbohydrates. They are usually formed by organisms

which cause the carbon dioxide of the atmosphere to combine with water. Carbon dioxide and water vapour can, however, be united as carbohydrate by purely inorganic processes, such as a flash of lightning, or they may combine slowly under the action of light.

The conditions in some places on the early Earth, such as the muddy shore of a lagoon, would have been very suitable for the chemical formation of carbohydrate. The earth would then have been covered by a dense cloudy atmosphere, which admitted sunlight but prevented chilling at night, and thus insured a practically unchanging temperature. The carbon dioxide in the air, which may have been discharged

into it from hot springs, would have united with water vapour to form a jelly composed of carbohydrate. This material would have absorbed nitrogen from some compound of ammonia, and by the interweaving of the constituents into a more complex structure have produced proteins, the main constituents of living matter.

Hence on the shore of the primeval world, in the warm mud beside a lagoon, with an unchanging temperature and in an atmosphere of a more complex composition than that of the present day, the action of sunlight may perhaps have produced, by purely physical processes, a carbohydrate and ultimately protein. This protein jelly would not become alive until it had acquired the power of absorbing food, of growth and of reproduction.

The absorption of food may have begun as a purely mechanical process. Plant-like structures can be grown from artificial seeds. If a small pellet, consisting of a mixture of 'Plants' from one part of sugar and Artificial Seed two of sulphate of copper, be placed in water containing from 1 to 4 per cent. of gelatin, 1 to 10 per cent. of common salt and 2 to 4 per cent. of ferrocyanide of potassium, the sulphate of copper acts on the ferrocyanide and forms a membrane of ferrocyanide of copper round the pellet. Water can pass inwards through this membrane much more readily than sugar can pass outwards—a phenomenon known as osmosis.

Hence as the sugar is dissolved the internal pressure in the 'seed' forces the surface to yield at the weakest point, which projects like a bud. This bud grows into a cylindrical stem, since the membrane yields most readily at the tip, where it is thinnest. When the stem becomes too long for its strength it bends over; the side becomes thinner on the outer side of the curve, and a fresh bud is formed there. The stem thus bifurcates, and by the repetition of this process the growing structure develops into a branched plant-like tuft. If a branch reaches the surface, the tip grows into a round disk like the leaf of some water plants.

Different forms of plant growth may be initiated by varying the composition of the 'seed' and the solution. The solution

described must be kept at a fairly high temperature; with other ingredients this is not necessary.

These artificial plants imitate the complex forms of vegetation by purely inorganic and mechanical processes. Later experiments have made structures which are claimed to reproduce the properties and movements of an organic cell. The absorption of food from the outside and growth into plant-like forms may therefore be a physical and not a vital process.

The repair and renewal of parts is a power shared with organisms by crystals, which retain this power with far greater persistence than animals. Thus a crystal may be broken, and if aeons afterwards it be fed with suitable material it will grow again, replace the broken portion and fill up cracks in perfect optical continuity with the pieces of the original crystal.

The last organic factor in Professor Osborne's series is that of reproduction. This process is a necessity due to the mechanical limitations of the size of structures, limitations which affect both the mineral and organic kingdoms. The constituents of a mass of granite, for instance, which is solidifying under uniform conditions in the interior of the earth might be expected to grow into crystals of gigantic size; but the usual crystals in

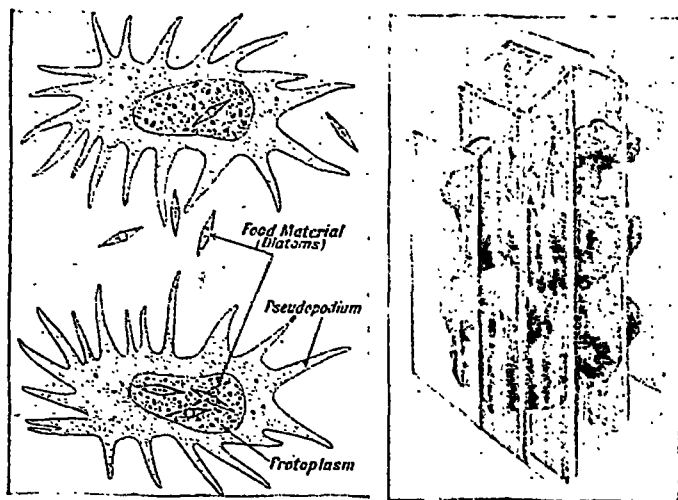
granite are not more than an inch or two in length. As soon as they have reached that size their growth stops and fresh crystals form; they, in turn, reach the usual size and are succeeded by others.

Hence there is no impossibility in the formation of a primitive organism by purely chemical and mechanical processes. This hypothetical first-formed and simplest of creatures has been named protobion. Its development into the protozoon, the most primitive of existing animals, would have followed the acquirement of greater activity and the eating of solid food instead of absorbing nourishment only from solutions. The simpler protozoa, during the creeping forward of their plastic bodies, come against a particle of food and flow around it. Any part that cannot be used as food is left undigested and ultimately expelled, just as a crystal selects from a solution the materials it needs for its growth and leaves the residue as 'undigested' extraneous particles.

The power of absorbing food as the result of movement stimulated the protozoa to more active life, and with this mobility they began to react more quickly to impulses; an increased sensitiveness which ultimately led to the development of instinct and intelligence.

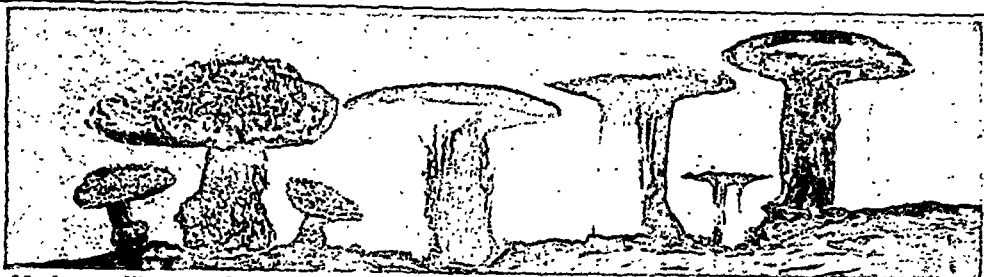
Another line of development was that of defence by attaching sand grains to the outer surface of their soft bodies, and thus forming a primitive shell. Subsequently more elaborate shells were formed by the secretion of silica or carbonate of lime on the surface of the body.

When the cloud belt which surrounded the early Earth was removed by chilling and condensation, the organisms had to adapt themselves to changes of temperature and to the passage from brilliant sunshine to the darkness of night. The changed environment rendered the processes by which a simple inorganically formed carbohydrate developed into living matter no longer possible. Accordingly it is only the life supposed to have been

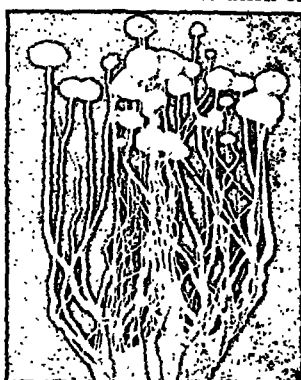


WHAT IS THE CRITERION OF LIFE ?

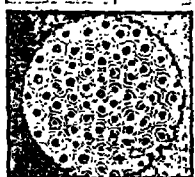
The protozoon (left), having flowed round its food matter, selects what can be digested and ultimately rejects what cannot. An imperfect or damaged crystal, like that shown inside the perfect form that it has grown (right), repairs itself by selecting suitable materials, neglecting the unsuitable.



Mushroom-like growths obtained by sowing calcium chloride in a solution of an alkaline silicate



Arbórescent calcium growths



Cells grown by diffusion in gelatin



Beautiful forms imitating water-weeds and shells; the former bear coloured capsules on each stem

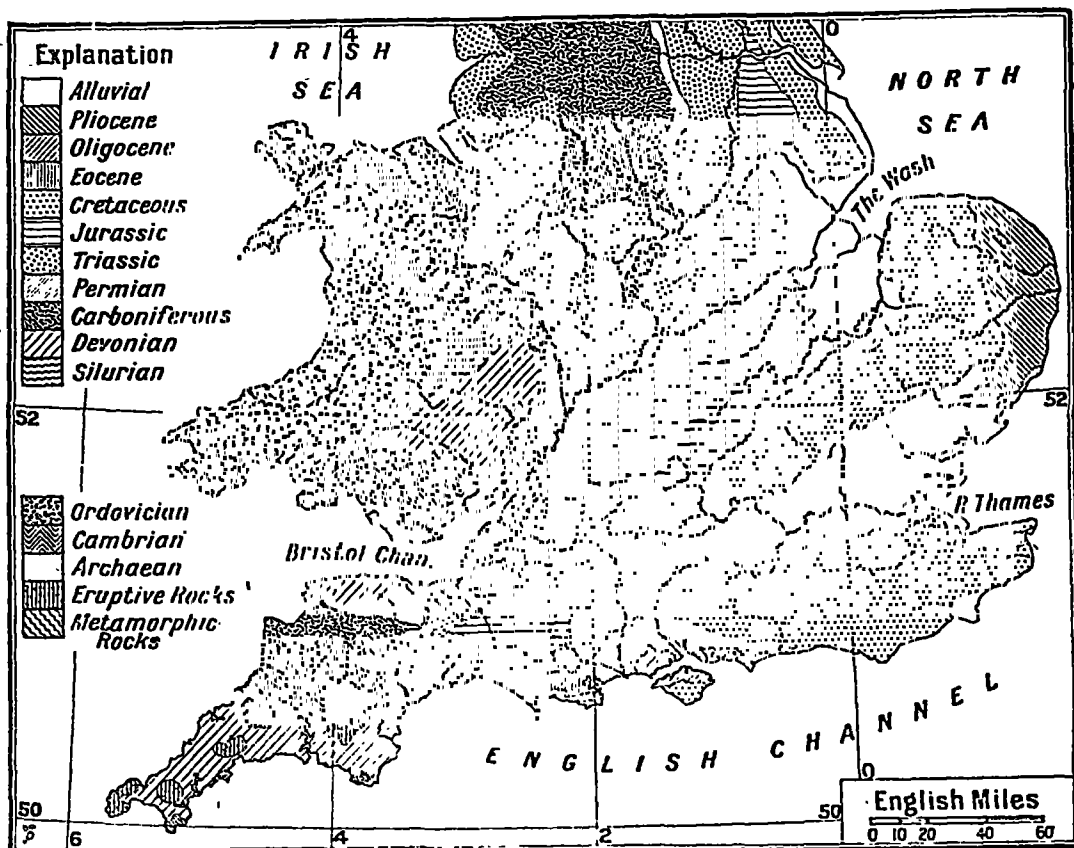


Adding sodium sulphate to the silicate solution results in a wonderful mimicry of coral

HOW SEaweeds, SHELLS AND FUNGI CAN BE MIMICKED IN THE LABORATORY

Crystals (see page 88) are often quoted as displaying some of the functions of life. What are called osmotic growths offer a far more exact parallel. By sowing granules of certain chemicals in certain solutions Dr. Stéphane Leduc of Nantes has produced these growths, which not only mimic living forms in an amazing way, including cellular structure, but even reproduce functions such as absorption of food from without, internal metabolism and excretion of waste products.

Photos by courtesy of Dr. Stéphane Leduc



AGE-SEQUENCE OF THE CLASSES OF ROCKS FOUND IN ENGLAND

As we travel across England from the south-east to the north-west, we find that the successive strata form a grain arranged in a definite age-sequence—further established in Wales by the geologist, Murchison. The rocks are youngest in the south-east, and gradually grow older as we advance north-westward. This is well illustrated by the sequence between the Dorset coast and South Wales.

formed in the Primeval Era that has since given rise by slow evolution to all the highly specialised modern animals and plants.

The materials for the history of most countries consist of three types. For the modern period there are abundant contemporary records; memories of an earlier legendary period are preserved in traditions and folklore; for the prehistoric period the only information available is derived from the interpretation of buried remains. The materials for the geological history of the Earth are of three similar kinds. The fossiliferous rocks give direct contemporary records for the latest division; for an earlier period the rocks contain no fossils, but the nature of the rocks indicates the conditions under which they were formed; and for the earliest division the evidence is so fragmentary and obscure that its interpretation is speculative. The rocks of the Pampalae-

ozoic Era correspond to the prehistoric stage with only indirect evidence; the rocks of the later part of that era correspond to the legendary stage; the clear contemporary evidence afforded by fossils begins with the Cambrian Period, the first division of the Era of Ancient Life which we are now to consider.

If the separate beds deposited in this era were arranged in a continuous succession their total thickness would be at least 30 miles; and for the study of this long series a classification is as necessary as it would be in a library with 30 miles of book-shelves. The rocks of this era were early divided into two sections. In the upper occur the coalfields and the limestone which form many of the English hills; and as coal has been mined regularly in the British Isles since the twelfth century the general relations of the coal beds to the rocks above and below were soon recognized.

Below the red sandstones which underlie the coal-bearing series is a confused jumble of rocks which are very irregular in composition, and have either no fossils or fossils which did not early attract attention. These old rocks, moreover, usually form hills and moorlands, and so were less often exposed during the building of canals and railways. The discovery of a definite sequence in these rocks was due to the scientific insight of a great British geologist, Sir Roderick Murchison.

His pioneer work was the more fruitful as it was guided by a theory which enabled him promptly to classify his field observations. It was then well

The grain of known that in south-England's rocks eastern England as a traveller goes to the north-west he continually meets older rocks which trend roughly from south-west to north-east. The grain of the country is due to the rocks lying like a series of books resting on one another and all sloping south-eastward. This succession may be observed when going from the coast of Dorset to South Wales; also from Southampton to central Wales; again, from London or the Essex coast across the northern Midlands to North Wales, and from Norfolk to the Lake District.

Sir Roderick Murchison thought that as this rule held so widely it would also apply to the unclassified rocks in the west and north-west of England. He passed from the western edge of the coal-bearing system into rocks then geologically unknown. He worked north-westward across Shropshire into North Wales, and found a succession of rocks which contained many fossils and proved, as he expected, to be older and older the farther he went to the north-west. Sir Roderick Murchison called these unclassified rocks the Silurian, after the tribe which occupied the district at the time of the Roman invasion.

Subsequently, two systems have been established below the Silurian. The next oldest system, the Ordovician, was founded by Lapworth. It was named after a tribe, the Ordovices, one of whose chiefs was the early British hero, Caractacus. The third system was named the Cambrian by Sedgwick, of Cambridge, from its

development in the heart of Cambria, near Snowdon and in the Harlech Mountains. The Cambrian system is important because it contains the oldest known series of well-developed fossils.

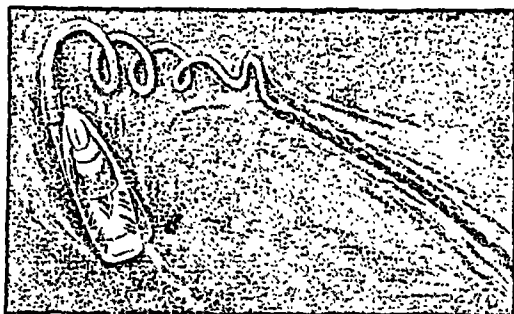
If an observer from another planet had watched the world from outside during the dawn of the Era of Ancient Life, he would have noticed no such fundamental physical difference in the condition of the earth as that which marked the beginning of the Primeval Era. Before that time the earth would have been in such a condition that no life could have existed on it, and the ordinary geological processes could not have been in operation. In the early part of primeval times the observer would have seen the earth surrounded by a thick, steamy atmosphere, through occasional breaks in which he might have seen a red glow from the heated surface of the earth, just as the glow of hot lava from an active volcano may be seen through rifts in the clouds. During the later part of primeval times, however, the earth would have cooled down and lost the visible signs of heat; the condensation of the clouds would have enabled the observer to see large parts of the surface and the existence of great continents occupied by red sandy deserts.

The passage to the Era of Ancient Life was not accompanied by any marked difference in the physical appearance of the earth. The predominant rocks were hard sand-
Sea over the stones which stood up in English Midlands long mountain ranges, and masses of slate, or of slate and sandstone, which formed broad uplands. If the observer had especially examined the British region he would have seen that Scotland was part of a great northern land, with the sea skirting the western coast, and farther south covering Wales and the English Midlands.

The first section of the Era of Ancient Life was still marked by frequent disturbances of the earth's surface, so that its rocks show great local differences in composition and succeed one another irregularly. The earth movements were not accompanied by great volcanic activity, though minor eruptions happened as in

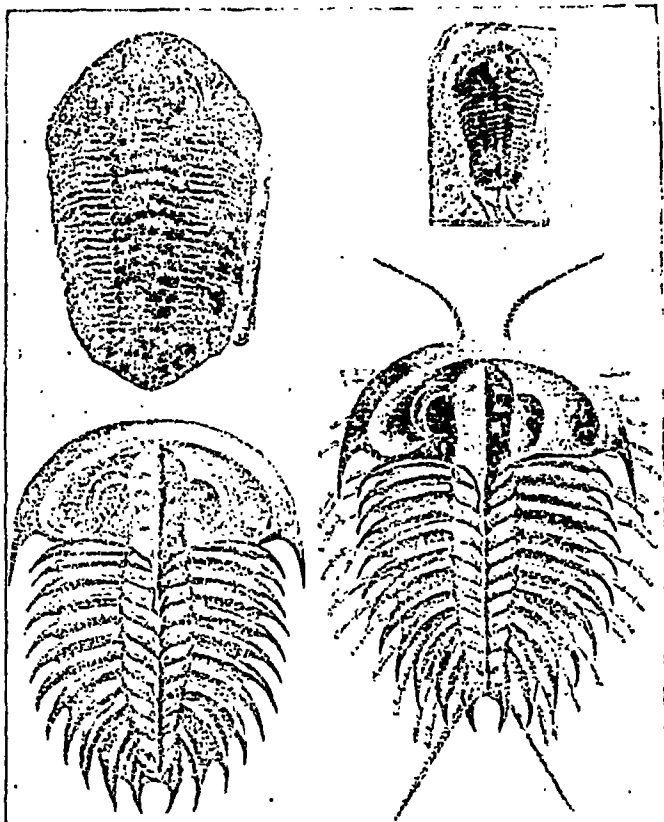
the neighbourhood of the Malvern Hills. The most momentous change which our imaginary observer might have noticed, if he had approached close to the surface of the sea, was in the nature of its animals and plants. During the preceding time the seas had been occupied by a rank growth of small water plants which formed the food of soft-bodied sluggish animals. The decay of this mass of organic matter probably gave the atmosphere the rank odour of a tropical forest or the evil smells which persist along a shore of mud flats at low tide.

In the first section of the new era the life was more varied and active. Innumerable worms burrowed through the sand of the shallow parts of the sea floor and along the shore; the mud banks were the homes of shell-fish similar to those that still live on the coast of Florida. Large numbers of shells lay on the sea bed, some with two valves like a mussel, and others with coiled shells like snails. There were also shell-fish with head and tentacles like the nautilus; but instead of the shell being rolled into a coil, it was a long straight rod. This shell would sink into soft mud, or when the animal swam backwards, by squirting water through a vent beside its mouth, would cleave its



BIVALVE OF THE CAMBRIAN MUD

In Cambrian mudbanks there lived innumerable shell-fish like the brachiopod shown above, a two-valved creature known as *Lingula pyramidata*; while worms infested the sea floor.



TRILOBITE SHELLS ENTOMBED IN ROCK

Most characteristic of the Cambrian fauna were the trilobites, extinct crustaceans distantly related to crabs. Fossils of three varieties are shown here, while in the bottom right-hand corner is a reconstruction of the form on the left.

Upper specimens from British Museum, Natural History.

way through the water like the ram of a steamer.

The most notable of these early animals, the trilobites, are now extinct; they had on the under side many jointed limbs, while the upper part was protected by a carapace or crust, from which the whole group of which the trilobites are members is known as the Crustacea. The most familiar living crustacea are the shrimps, lobsters and crabs. Some of the early members of this group were shrimp-like and had a long tail, which was composed of many sections and was used for swimming; others more resembled the king-crabs of to-day in being completely covered by their carapace. The trilobites were the most specialised and highly developed organisms in the Cambrian seas and were so characteristic of it that it is known as the Age of Trilobites. In contrast to these active animals were

the primitive corals which formed reefs in some of the Cambrian seas.

The first striking fact in regard to the life of this early period is that so many different groups of animals were already in existence. The animal kingdom is divided into three categories, of which the simplest, the unicellular animals, consist only of a single cell, or of groups of cells all of one kind. These animals, being the most primitive, were

Diversity of naturally living at the Cambrian fauna time of the oldest known fauna. The second division consists of animals which are built up of many cells and of different kinds of cells, but which are without a backbone. This division includes eight subdivisions: the sponges; hydroids and jelly fish; anemones and corals; sea-urchins, starfish and sea-lilies; worms; jointed-limbed animals (crustacea, insects, etc.); bryozoa and lamp shells; and lastly, shell-fish. All these eight groups are represented in this oldest fauna, and by highly specialised animals in which the characteristics of each group are well developed. The third primary division of the animal kingdom includes animals with a backbone, and no representative of it is known in the Cambrian or until the Silurian Period.

In accordance with the now almost universally accepted doctrine of evolution, all the Cambrian animals were descended from one common ancestor through a long process of development, which must have taken aeons of time. The length of time between the beginning of the Era of Ancient Life and the present day is now generally estimated at 1,500 million years, or perhaps several thousand millions of years. This, at least, is in accordance with the evidence of the radioactive rocks. Nevertheless it is often considered that the development of this Cambrian fauna would have required a period as long as that between the Cambrian Era and the present day.

It long surprised geologists that they could find no trace of the ancestors of the Cambrian fauna in the rocks of the preceding era. Many of those rocks would have preserved as fossils any shells or corals embedded in them. The survival

of the canals or tubes in the phosphatic grains of Loch Broom, once occupied by a simple form of life, show that delicate organic structures have been preserved. Some of the Torridon Sandstone of the north-west of Scotland is so little altered and so similar to the Old Red Sandstone that it was long identified as such by Hugh Miller, who made his reputation by his discoveries of fossil fish in that formation.

But the absence of fossils from the unaltered primeval rocks shows that no animals then in existence had parts hard enough for preservation as fossils. There must have been some change in the condition of the world at the beginning of the Era of Ancient Life which led many different kinds of animals simultaneously to develop shells or other means of defence. The main purpose of a shell is protection against carnivorous animals. The shell-fish has a soft, succulent body, like the oyster; it therefore requires protection, which it usually obtains by the development of a shell sufficiently strong to resist the enemies which would devour the body if they could break through the shell. The resistance of shells is often increased by needles or spines or thorny outgrowths, which are as effective in defence as the barbed wire and spikes around a fortification.

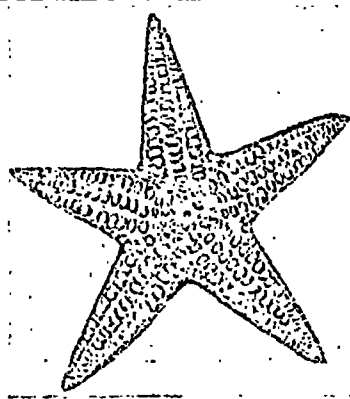
The first animals lived upon vegetable food, and while they were all vegetarians, shells and other defensive structures were needless. At the end of the Primeval Era one class of animal, probably the ancestors of the trilobites, acquired a taste for an animal diet. Food was then so abundant and defenceless that the carnivorous creatures doubtless grew quickly in numbers and strength, and soon became dominant. Their continued increase threatened the extermination of forms of life which could not adapt themselves to a 'safety-first' policy. Some of them gained security by burrowing in the mud; others, such as the sponges, rendered their soft tissues noxious as food by the growth of spicules or sharp spines which would have irritated the mouth or digestive system of any animal that devoured them. Others



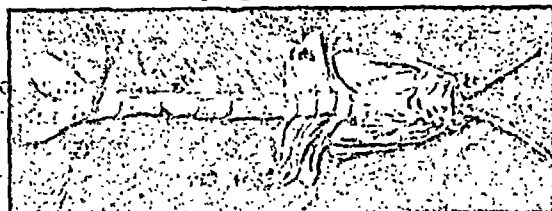
Globular sponge



Jelly-fish



Starfish



A Cambrian crustacean (brachiopod)



Cephalopod shell



Cambrian coral



Middle Cambrian worm



Lamp shells

SCARCE ALTERED FOR MILLIONS OF YEARS: TYPES OF CAMBRIAN LIFE

Backboneless animals, excluding the great class of unicellular organisms, may be divided into eight categories; and what is most striking about the Cambrian Period (the first to contain fossils) is that all of them are already found represented in its rocks. Another fact to impress anyone who studies this group is the small change that each has undergone in the millions of years that separate them from to-day. Notice, too, how a soft creature like a jelly-fish has had its outline preserved.

enclosed their soft parts in hard shells, which were composed of a pair of shields or of a tube which was generally coiled into a spire or disk. Some animals adopted an armour of overlapping scales, or plates; and others maintained their existence by acquiring powers of swift movement.

The sudden appearance of so many groups of highly organized fossils at the beginning of the Era of Ancient Life is not, therefore, evidence of the sudden appearance of life, but only of the first development of shell-bearing animals.

The second period in the Era of Ancient Life was the Ordovician, and it was characterised in the British Isles by intense volcanic activity. At the beginning

of the period enormous volcanoes in the English Lake District discharged floods of lava, and the huge sheets of volcanic ash that form the green slates around Borrowdale in Cumberland. At the same time lava-flows from the volcanoes in south-western Scotland reached the sea, and their sudden chilling by the water gave them the rounded surfaces of pillow lavas. That they entered the sea is shown by the fact that the hollows between the pillows are often filled with a siliceous rock known as chert, containing marine fossils.

While volcanoes were active in the Lake District and in the south of Scotland, the English Midlands and Wales were covered

by sea. This sea increased in area during the middle part of this period, and on its floor were laid down flagstones and shales containing abundant marine fossils. Towards the end of the Ordovician Period volcanic action broke out with renewed intensity, but the seat of the eruptions had moved southward into Wales, where Snowdon was built up as a great volcano. The harder rocks of Snowdon are mostly lavas, and they are interbedded with layers of volcanic ash ejected during the eruptions. It has been pointed out that the volcanic ashes are most abundant on the north-eastern side of these volcanoes, so that the prevailing wind then, as now, blew from the south-west.

The ordinary rocks laid down in the Ordovician seas included much finer material than those characteristic of the Cambrian. Limestones are still scarce in the British Islands, but one layer, the Bala Limestone, was laid down in North Wales, another bed in Ayrshire, and a thick series in the north-west of Scotland, extending from Durness on the Pentland Firth to Skye. The commonest Ordovician rocks are coarse sandstones and grits, and these in many parts of Britain are thousands

of feet in thickness. In the central part of the southern uplands of Scotland the Ordovician system is represented chiefly by bands of black slate.

The fossils found in these slates show that although the slate series is thin it includes representatives of various subdivisions which in other parts of the British Isles are represented by thousands of feet of coarse sediment. The first explanation offered of these thin, fine-grained black slates was that they had been laid down in a deep sea far from land, like the oozes on the floors of the existing oceans. The existence, however,



WHERE MOLTEN ROCK MET THE SEA : PILLOW LAVA IN AYRSHIRE

In the Ordovician Period, following on the Cambrian, much of England and Wales was covered by the waters; but Scotland was the seat of violent volcanic activity. Where lava-flows met the sea—as here near Ballantrae in Ayrshire—the sudden chilling gave them a pillow shape; that this is the explanation is shown by marine deposits of chert between the lava-pillows (see detail photograph above).

Photo, Geological Survey and Museum



ERUPTION OF AN ORDOVICIAN SNOWDON

Snowdon in late Ordovician times was a volcano, perhaps five times as high as it is now (3,560 feet). The volcanic ash, which occurs mainly on the north-eastern side (the side shown here in the photographic portion) shows that the prevailing winds were then blowing from the same quarter as to-day.

Photo G. P. Abraham

of a deep ocean basin in Scotland in Ordovician times is unlikely, and another explanation of these slates appears more probable.

Probably in Ordovician times a mountain range crossed Scotland from Aberdeenshire into the southern uplands and there formed a high coast from which the drainage flowed at first inland and the drainage entered at this point and reached the sea to the north-east or

north-west. The coast to the southward projected in bold headlands; the bays between them received but little coarse sediment, and their floors were covered by fine mud which has been compressed into black slate.

Meanwhile, the west of Scotland was occupied by a great valley which reached the sea near the present Firth of Clyde. The mud and sand from the northern land were swept into this estuary, and deposited as thick beds of sand and clay. The Ordovician sediments in the south of Scotland may be compared to a pile of books; in the central uplands around Moffat every one of the volumes is represented, but only by a few of its leaves, so that the total thickness there is but small.

The land which then provided the abundant sediments, such as those we now find in the Clyde estuary, doubtless extended eastward to Scandinavia and Finland, and westward right across the Atlantic to the north-east of America. The limestone of Durness in the north-western corner of Scotland was deposited in the sea to the north of this land. The fossils in that limestone are so different from those of the Ordovician rocks of the south of Scotland, the English Midlands and Wales that the seas to the north and south of this land must have been completely separated. Hence the

Ordovician fossils of the north-west of Scotland are allied to those of far distant localities in the eastern United States, and are strikingly distinct from contemporaneous forms that lived near by in the rest of the British Isles, or comparatively near by, in western Europe.

The Ordovician Period was brought to an end by earth movements which led to a great change in the geography of the

British Isles. The land increased in area by a great extension eastward, and an island which had occupied only the English Midlands was lengthened south-westward over the Bristol Channel and north-eastward to join a land which covered most of the North Sea.

The period just ushered in is called the Silurian, and is marked by the first appearance of backboneed animals. Its earliest deposits were thick beds of coarse sandstone and shales laid down in a shallow sea; but, later on, the sea was enlarged, so that the few animals which lived in it at the early part of the time gave place to a much richer and more varied fauna. The land in the Bristol Channel may have extended far to the south-westward that it almost joined a promontory from Brittany which projected far into the Atlantic. Wales and the western Midlands were, therefore, covered by an inland sea, of which the only outlet lay to the south of Ireland. Its water was not that of the open sea, and comparatively few animals were able



CORAL FROM WENLOCK EDGE

Coral-polyps growing on the Silurian sea-bed built great reefs that now stand up—they or their detritus—as hills of coralline limestone on the Welsh marches. This fossil coral is a specimen from Wenlock Edge in Shropshire.

From British Museum, Natural History



BRITAIN IN THE SILURIAN PERIOD

After the Ordovician, the Silurian. Ireland, Wales and north-western England were now covered by an inland sea (unruled in map), warmed by southern currents so that half-tropic creatures such as corals flourished in its waters.

After Jukes Brown, Building of the British Isles.

to live in it, until the connexion to the ocean had been enlarged.

This change happened during the Silurian Age and the temperature was raised by the entry of warm water, blown by the wind from the south-west. The English sea was warmed by this current and was cut off from the cold northern water by the emergence of land to the north-east. The temperature of the sea over the Welsh borderlands during part of the Silurian period was sub-tropical and coral reefs built up a bed of limestone which is to-day the 40-mile-long ridge called Wenlock Edge. In this sea lived luxuriant groves of sea lilies, whose remains contribute so largely to some limestones that the Silurian has been called the Age of Sea Lilies.

The advance of the sea upon the land was not limited to the British Isles. It is a feature of the Silurian period throughout the world. Geologists at first imagined that the interchange of land and sea was local and irregular, subsidence in one place coinciding with uplift elsewhere. It was, however, pointed out by the great Austrian geologist, Eduard Suess, that at

various times of geological history the sea made a world-wide advance upon the land. He called these movements marine transgressions. The alternate rise and fall of sea level does not imply any variation in the amount of sea water, although its quantity has probably been increasing throughout geological time. These transgressions were due to redistribution of the water, independent of the continuous increase in volume.

Time after time, as the earth shrank in size, there were widespread upheavals and sinkings of the surface. An upheaval of the floor of an ocean makes its basin shallower, and the water displaced advances on the land, submerging low coastlands in all parts of the world. This movement may be succeeded by a fresh deepening of the ocean basins, which are filled up by the flow of water into them, so that the coastland again emerges. The great transgressions are due to the advance and retreat of the sea, and not to the rise and fall of the land that has undergone submergence and emergence.

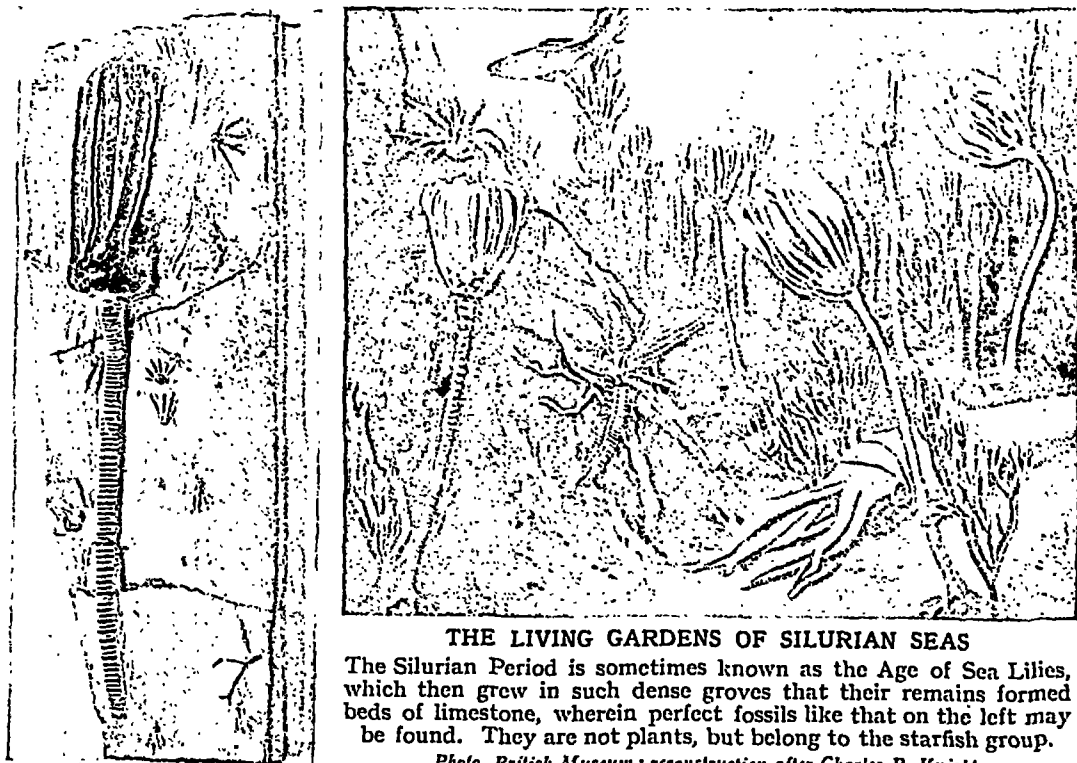
That the contraction and expansion of the Silurian seas were due to relatively quiet earth movements is indicated by

the comparative rarity of volcanic eruptions. Volcanic action had ceased in the British Isles and most parts of the world enjoyed volcanic rest.

During this Silurian period animal and plant life continued to develop, and made three important advances. The Silurian affords the first direct evidence of land plants, which are represented by seeds or spore cases found in the upper beds. The development of land plants rendered possible the existence of insects and the oldest known remains of them are Silurian.

The most important development of the period was, however, the first appearance of the vertebrates, or animals with backbones. They were then represented by the first certain fossil fish, and belonged to primitive types such as the sharks. They found food so abundant and easily caught that their numbers waxed exceedingly and a bed composed of fossil fish bones was laid down over an area of about 1,000 square miles in the Welsh border counties alone. From this point the story of vertebrate life is taken up in the following chapter.

At the end of the Silurian Period its quiet earth movements gave place to



THE LIVING GARDENS OF SILURIAN SEAS

The Silurian Period is sometimes known as the Age of Sea Lilies, which then grew in such dense groves that their remains formed beds of limestone, wherein perfect fossils like that on the left may be found. They are not plants, but belong to the starfish group.

Photo British Museum; reconstruction after Charles R. Knight.



WHY OLDER MAY COVER YOUNGER ROCKS

The great Caledonian disturbances that closed the Silurian Period were caused by crust shrinkage, and involved the thrusting of adjacent strata one over the other. Sometimes older rocks were superimposed on younger, as here in Ross-shire where Torridon Sandstone (dark) overlies later quartzite.

Photo, Geological Survey and Museum

violent disturbances. The crust of the Earth, having become thicker and more rigid, no longer contracted by general folding; the crust resisted compression until it yielded along relatively narrow belts which underwent intense dislocation. Large slabs of rock were pushed over one another like tiles on a broken roof.

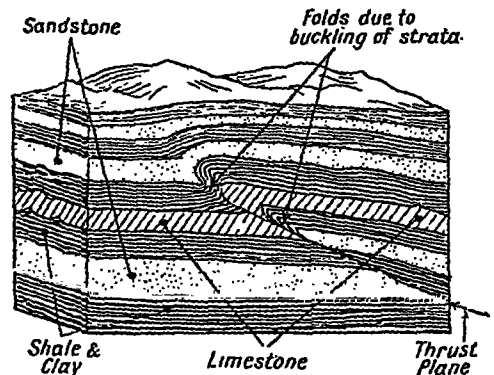
The correct interpretation of areas where old rocks have been pushed sideways above younger rocks proved very difficult. The position of old above young appears inconsistent with the fundamental principle of geology that in a series of rocks the lowest are the oldest. And indeed this principle always does apply except where the beds have been overturned by folding, or by slabs of rock having been pushed sideways along planes of movement known as thrust planes.

Such movements had been previously recognized in the mercury mines of Idria; but their extent was first realized by the

study of north-western Scotland. There a belt of rocks eighty miles in length from the Pentland Firth to Skye has been pushed westward for a distance in some places of ten miles. At the same epoch in Scandinavia a tract of country about 1000 miles in length was pushed eastward for several miles. The evidence from Scandinavia shows that the movements there happened about the end of the Silurian period, and the Scottish thrust planes were doubtless of the same date. These movements produced mountain ranges which are widely distributed in western Europe and trend north and south. They and the movements which made them are known as Caledonian.

The period that followed is known as the Devonian. Now the Caledonian movements had led to a further withdrawal of the sea from north-western Europe, and a continent which included Finland,

Scandinavia and Scotland extended across the Atlantic to eastern America and as far north as Greenland and Spitsbergen. The same movements had produced many



HOW A THRUST PLANE OCCURS

This diagram shows how the result illustrated in the photograph above would be brought about. Aided by a fault in the Earth's crust, the strata on the right (a 'thrust plane') were slid by lateral pressure over their neighbours.



DEVONIAN FISH TIGHT PACKED IN A POCKET OF OLD RED SANDSTONE

Strata of Old Red Sandstone were laid down during the Devonian, a period of desiccation. This we infer from the fact that they contain practically no fossils, except in scattered pockets where petrified fish are found packed no less tightly than sardines. In other words, the marine animals from large areas became collected into the last remnants of drying lakes or the pools of seasonal rivers.

From the British Museum, Natural History

mountains in this northern land; rivers that flowed from them washed down vast quantities of sand and pebbles, which were deposited in the valleys and formed wide plains. The rivers flowed across these plains along meandering courses that were constantly changing.

Their beds were raised by deposits of earth and stones carried down from the hills during floods. When the bed reached a certain height the river was forced to choose a lower course, until that in turn was raised above the general level, and the river again diverted. The rivers were mostly shallow; after heavy rain in the mountains they were wide and swift; but during dry seasons they dwindled to insignificant streams. They were similar to those known in New Zealand as 'shingle rivers.'

The rivers from the New Zealand Alps have deposited fan-shaped sheets of sand and gravel, which, as the Canterbury Plains, extend from the mountains to the coast. Across these plains the rivers flow along bands of shingle miles in width, and through constantly changing courses. Some parts of the shingle belts are only covered by water at intervals of many years; while the pebbles are exposed to the scour of wind-blown sand they

are faceted and polished. Bends of the river are often cut off as lakes, and their water is lost by evaporation or sinking underground. The fish are crowded into the last of the pools, and then deposited in the mud on its floor. If the dried lake be next covered by clay blown across by the wind, they may be preserved as a fossil fish bed.

The Old Red Sandstone (which, with the Devonian rocks, occupies the interval between the Silurian and Carboniferous periods) was formed under some such conditions. It consists mainly of coarse sandstones, most of which include no fossils; but occasional layers of clay and flagstones are crowded with fossil fish or contain a few fresh-water shells and land plants. The fossil fish are so closely packed in some beds that they must have been collected into pools from wide tracts of water. No trace has been found in the Old Red Sandstone of marine animals; there are no corals or sea lilies, or trilobites, or sea shells; so the beds must have been laid down in fresh water. The pebbles along these ancient river beds show frequent signs of erosion and polishing by the action of blown sand, proving that they were often left for long periods exposed to the force of the wind.

The fish of the Old Red Sandstone were so predominant, so varied, and some of them so large, that the Devonian is sometimes known as the Age of Fish.

The Old Red Sandstone also marked a great advance in the life on land, as then, for the first time, the ground was covered by continuous sheets of vegetation forming turf. Some beds of chert at Rhynie in western Aberdeenshire contain the beautifully preserved remains of a primitive land flora. Several plants, such as *Rhynia*, grew like the grasses that clothe modern sand dunes. *Rhynia* had a network of long, underground stems which at intervals sent up vertical stalks which were crowded like those in turf. The minute structure of this and its associated plants has been perfectly preserved in the Rhynie chert.

The shifting sands that were probably universal in pre-Devonian times were subsequently limited to deserts and sand dunes. The rest of the land soon

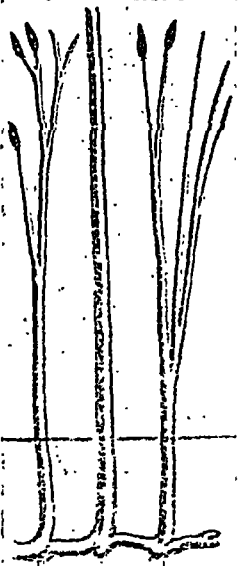
became covered with a mantle of vegetation which rendered it a suitable home for specialised animals, which had been previously restricted to the sea and to lakes.

South of the land on which the Old Red Sandstone was deposited there was a sea which covered much of central and western Europe, including the south of Ireland, Devon, Cornwall and the rest of southern England, and northern France. It extended across Belgium and central Germany, and farther east expanded northward till its shore lay a little south of the Gulf of Finland, and across north-eastern Russia. This sea was warmer than any part of the European seas at the present day, for coral reefs, though less luxuriant than in the Silurian, still grew in Devonshire and formed coral reefs like those around the volcanic islands of the tropical Pacific.

These marine deposits were called the Devonian System as they were first recognized in Devonshire. They are the marine beds deposited while the Old Red Sandstone was being formed on the continent to the north. The Devonian Period was one of especially great earth movements; and they were often followed by violent volcanic eruptions, which discharged lavas similar to those of the great volcanoes of the Andes.

The Devonian Period was brought to an end at first by a rise of the sea, and then by subsidences which led to the submergence of much of the Old Red Sandstone land. In the sea was deposited a thick sheet of grey limestone which, as it forms some of the better known English mountains, including the Mendip Hills, the Pennines, the Peak and the hills beside the South Wales coalfield, was called the Mountain Limestone. It is now generally known as the Carboniferous Limestone, being the first important member of the Carboniferous System, which includes most of the world's chief coalfields.

The Carboniferous Limestone sea first submerged the south of England, and gradually extended northward over a ridge which in the early part of the period had formed an island across the Midlands. The sea ultimately covered northern England and southern Scotland. It there bordered the shore of the northern continent, and



THE EARTH'S FIRST TURF

Before Devonian days the Earth was barren; but now appear grasses, such as the *Rhynia* (above) preserved in Aberdeenshire chert beds. The landscape must have looked like the Culbin Sands, half-reclaimed by planting bent-grass.

Rhynia restoration fr

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the sand and clay washed from the land formed beds of sandstone and shale with some thin limestones. The thick limestone of the south of England was reduced in Scotland to thin beds deposited during intervals when the sea covered the land. This sea in Scotland and Northumberland was either filled time after time by the deposition of sediments, or was expelled

features in the scenery of the Midland Valley of Scotland.

In the south-east of Scotland around Edinburgh volcanic activity was less powerful and the country was covered by lagoons inhabited by shoals of fish and by small water fleas whose remains are found in myriads in some of the clays. These clays and some coals, known as



ANCIENT VOLCANIC VENT TO BE SEEN A FEW MILES FROM GLASGOW

With the dawn of Carboniferous times the volcanoes of south-western Scotland broke out with renewed violence. Their presence is attested by vast sheets of volcanic rock and ash, but they themselves have been worn down by the weather to mere stumps—the lava-plugs that once filled their vents—like Dumgoyne Hill. Here the slopes of talus, from weathering, stand out clearly.

Photo, Geological Survey and Museum

by a renewed uplift of its floor. The land was covered with sand dunes and swamps, while forests grew over the plains; and the accumulations of dead vegetation on the floor of forests, in lakes and in swamps, gave rise to seams of coal.

The beginning of Carboniferous times in the south-west of Scotland was marked by a gradual change from the arid plains of the Old Red Sandstone to a vast series of salt lagoons. The dry climate of the Old Red Sandstone was replaced by the humid conditions of the Carboniferous. At this time the south-west of Scotland was a country of great volcanoes. Their vents, such as the hill of Dumgoyne, may be seen near Glasgow, while the plateaux beside the lower Clyde were built up of alternate layers of lava and volcanic ash. Terraced volcanic hills are familiar

cannel coals, when heated in a retort give off oil, and the modern mineral oil industry was founded in 1850 by the production of oil and paraffin wax from the richest of the Scottish oil-producing minerals.

The British Isles at the beginning of the Carboniferous Period consisted of northern highlands occupying most of Scotland and north-western Ireland, of a volcanic country in the south-west of Scotland, and of lagoons in south-eastern Scotland; while a wide open sea covered most of England and nearly the whole of Ireland. This sea was gradually displaced by the filling up of its basin; the formation of limestone was succeeded by the deposition in shallow water of coarse sand, which has been cemented into rock so useful for millstones that it is called the Millstone Grit.

In Scotland the Millstone Grit is represented by a still more valuable material, as the clay deposited in the lagoons can be made into fire-bricks and retorts of especially high quality. These lagoons were the estuaries of rivers that discharged from the northern land; and that it still extended across the Atlantic is shown by the range of some freshwater and brackish-water shells from Scotland westwards to Michigan in North America.

The withdrawal of the sea led to the conversion of the British area into a land covered by rank forests, the vegetation of which has given rise to seams of coal. In some coalfields each seam rests upon a clay which formed the soil of the old forest. After the layer of dead vegetation had thickly covered the soil, the forest died. If the site were covered by layers of earth they formed a new soil and the place was again covered with forest, and the material for another coal seam was produced. In the Yorkshire coalfield this process was repeated many times. In

Silesia this repetition of clay, coal and sandstone happens more than twenty times.

The characteristic features of the world in the Carboniferous Period were the wide extent of the lowland plains on which the coal forests grew, while the mountains were unusually low. During the earlier part of the Carboniferous Period Rank forests of mountain uplifts were the Coal Measures unimportant, and the high country was steadily planed down by rain, rivers and frost, while large areas sank in mass to lower levels. The general levelling of the surface and the intermingling of land and water, due to the seas extending far into the lands, gave the world as a whole a warm and moist climate with only moderate variations between heat and cold. The plains and inland basins were covered by luxuriant forests, which were buried and preserved as coal seams owing to the sinking of the land.

The differences in climate between winter and summer, between the tropics and polar regions, and between the coastlands and the interior of continents, were less extreme than they are to-day; for the lowness of the mountain ranges deprived the world of the chilling effect of the highland snowfields, and lessened the contrast between the well-watered outer slopes of the continents and the dry basins within. The climate of the whole world was not uniform; for there is ample evidence that the regions round the poles were colder than the central zone. The sea was warm in the south of England, since corals built reefs there, though they were less prolific than those that lived around the islets of Devonshire in the preceding period. Farther north the coral reefs are smaller and fewer.

These climatic conditions have rendered the Carboniferous formations the main storehouse of the world's coal, and of much of its oil. The same geographical factors also led to important developments in the life of the world. The forests provided food and shelter for land animals, while the conditions of the sea were favourable to marine life.

The most important advance of life in the Carboniferous Period was the first



BRITAIN IN CARBONIFEROUS TIMES

The Carboniferous was a period of marsh-lands wherein swamp-forests rioted. During its later phases the peninsula (obliquely ruled) stretching across England subsided, leaving an island at its extremity. The island in Scotland was volcanic.

After Jukes Brown, Bushing of the British Isle:

appearance of quadrupeds. They belonged to the class of amphibians—now represented by frogs, toads and newts—and their development, after the adoption of a lung-breathing habit by some Devonian fish, probably followed the growth of land vegetation, which provided abundant food supply and shelter. (For this subject see further under Chap. 3).



HOW BRITISH COALFIELDS WERE SAVED

When at the end of the Carboniferous Period the crust became folded into ridges, most of the coal-measures were lost through denudation and only those preserved that lay in the pockets of the hills. They are now covered again with later deposits.

The coalfields were probably once continuous over most of England, Wales, Ireland and southern Scotland; but at the close of Carboniferous times north-western Europe was folded into a series of mountain ranges, and along their summits the coal measures were washed away and the underlying rocks exposed on the surface. North of these mountains the country was folded into gentle waves; part of the land was raised into arches by upfolds, and the intervening country sank into basins or valleys by downfolds. In the downfolded areas the coal measures were buried and preserved; they were destroyed over many of the upfolds by the attack of wind and water, and the underlying Carboniferous limestones and still older rocks were exposed at the surface. Ireland was especially unfortunate; it was no doubt once wholly covered by coal measures, but they were nearly all swept away, and the country left as a plain of limestone. The Carboniferous Limestone was exposed in England by the upfolds that made the Pennine Range, the Peak of Derbyshire,

the hills surrounding the coalfield of South Wales, and the Forest of Dean and the Mendip Hills. Within these upfolds the coal measures were preserved, and thus the English coalfields are a series of isolated basins with rims of older rocks, as shown in the map in page 78.

The five previously mentioned periods of the Era of Ancient Life take their names from British formations, and they were defined by work on British geology. The sixth and last period of that Era takes its name from the province of Perm in eastern Russia. The history and rocks of this period offer in all respects a striking contrast to those of the Carboniferous.

The English coal measures are often covered by large tracts of red sandstones and clays, which were so similar in appearance to the red sandstones beneath the Carboniferous that they were at first confused. Their distinction was of primary importance in determining the distribution of the coalfields. The rocks below the Carboniferous were called the Old Red Sandstone, and those above the New Red Sandstone. The lower part of the New Red Sandstone in England is best represented along the eastern side of the Yorkshire coalfield, and on the coasts of Durham and Northumberland.

The series begins with variously coloured sandstones and marls, usually about 200 ft. in thickness and covered by a band of marl which, as it breaks into thin slabs, is known as the Marl Slate. This is covered by a thick bed of dolomite, the Magnesian Limestone, which underlies red sandstones and clays containing thin layers of sulphate of lime (gypsum). Fossils of the New Red Sandstone are found both in the Marl

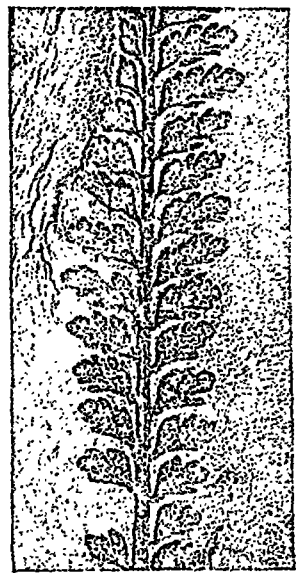
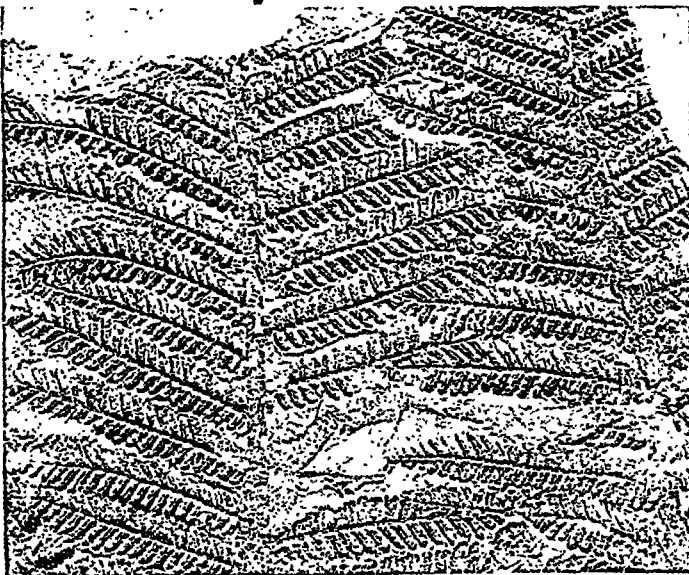
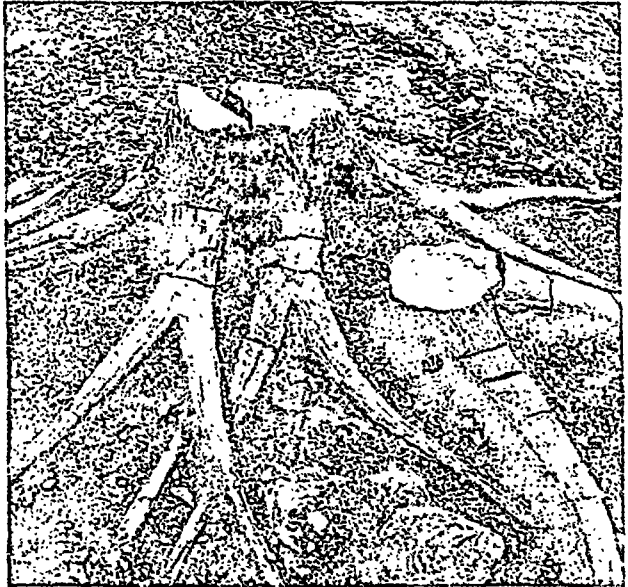
Slate and in the Magnesian Limestone; they include fish and remains of reptiles, as well as various stunted shells of species which survived from the Carboniferous Period, although the geographical conditions were unfavourable.

A similar succession is found in Germany, where, however, the beds contain much larger deposits of salt and gypsum. The Permian deposits of Germany consist of two types: a great mass of unfossiliferous purple sandstones lies at the base; above are marls and limestones, the Zechstein,

containing marine fossils which, like those of England, must have lived in water different from that of the open ocean. An inland sea like the Caspian must have covered most of Germany, and extended westward to Durham, eastern Yorkshire and Nottinghamshire. Its composition slowly changed as rivers carried fresh water into it, while in periods of evaporation its salts were precipitated.

At the end of the period the sea had disappeared from the British area, leaving deposits of gypsum at the top of the Permian series in north-eastern England. The rest of the British Isles in Permian times was a desert. That its deposits of red sandstone and shale were formed under arid conditions is shown by several features. The sand grains are often beautifully rounded like tiny marbles, as they have been rolled over one another by the wind. The beds are often irregular and tumultuous like those of sand dunes. Many

of the pebbles have flat surfaces which have been cut and polished by the wind, and the surface of the quartz pebbles is smoothed and etched. The sandstones often contain small patches coloured black by oxide of manganese, which is also a feature familiar in modern deserts. The



PETRIFIED VEGETATION OF LONG VANISHED CARBONIFEROUS FORESTS

Some coal was formed from dead vegetation, washed down into drainage basins countless aeons ago; but where it resulted directly from forest growth, fossil roots are sometimes discovered embedded in the ground beneath and attached to trunks that grew up through the coal seam, as at Clayton near Bradford (upper photograph). Often, too, by a happy accident the undergrowth of ferns has preserved a record of its structure by leaving impressions in the surrounding material.

Photos, Geological Survey and Museum

only fossils found in these deposits are occasional footprints of reptiles left on the muddy shores.

That these desert deposits were contemporary with the Magnesian Limestone of the east of England is shown by the fortunate occurrence at Hiltonbeck, near Appleby, of a thin layer of dolomite in the desert sandstones; it was laid when a gulf from the eastern sea once extended into the western land.

The differences between the Carboniferous and the Permian Systems were due mainly to the influence of the movements of the crust. The gentle

How the Altaid movements during the Mountains arose Carboniferous were succeeded by quicker subsi-

dences accompanied by vast volcanic eruptions. The crust of the earth had become too big for the interior, and was reduced by the sinking of large areas and the crumpling of the intermediate bands into fold-mountain chains. They are often known as the Hercynian mountains; but that name has been used in so many ways that the term Altaid, proposed for this group from the Altai Mountains of central Asia, is more definite and descriptive.

The Altaid mountains trend roughly east and west across Asia to the north of the younger mountains of the Himalayan system. The Altaid system is continued in Europe, north of the Alpine mountains; it includes the chief highlands of central Germany, and the hills of Brittany, Cornwall and Devon and the south-west of Ireland. In America the Altaids are represented amongst others by the Appalachian Mountains, and in Australia by the ancient mountains, of which the worn stumps form the existing Eastern Highlands.

These Altaid mountains were upraised in the latter part of the Carboniferous and in the earlier part of the Permian by one of the greatest mountain building convulsions in the history of the earth. The age of the folding is proved, for example, by the structure of the Bristol coalfield. It consists of a basin surrounded on all sides by rocks which are older than the Coal Measures, and once formed a ring of hills around the coalfield. The hills

were worn down to a plain, on which was deposited a conglomerate containing many pebbles of the variety of limestone known as dolomite. The teeth of reptiles occur in it and show that it belongs to the middle part of the Permian Period.

The mountains then formed were probably as high and as continuous as any on the earth at the present time. These lofty chains produced great local differences of climate. Vast snowfields formed upon their higher slopes, and fed glaciers that flowed down to sea level. Where the glaciers reached seas that were separated from the tropical waters, and were freely open to the polar seas, the ends of the glaciers floated away as icebergs and dropped huge blocks of rock on the sea floor, which was covered with large shell-fish.

The winds from the sea dropped all their moisture as rain and snow upon the mountains, and their effect farther inland was dry and parching. The air falling down the inner slopes of the mountains was also heated by compression, just as air becomes warm in a bicycle pump. This hot, dried air withered the meadowlands of the Carboniferous Period into dry plains with the scanty vegetation of steppes; and their

scattered tufts of vegetation in time disappeared, leaving only desert. The rivers dwindled in volume, and were no longer able to keep their channels clear by removing the sand blown into them by the wind; thus, the river valleys were broken into chains of lake basins. The water in the lakes was concentrated by evaporation and became salt; and if they completely dried up, all the material dissolved in the water was deposited on their floors.

Arms of the sea were often cut off from the ocean as lagoons; and as their waters were reduced by evaporation, the mineral constituents were deposited as gypsum and common salt. At one time the whole of the water in the German Sea was lost by evaporation, and the salts of potash and magnesium which remained in the final brine or bittern were deposited in the deeper basins. Hence Central Germany includes not

Results of the Permian drought

only vast beds of gypsum and salt, but also the main store of the potash salts available for use as manure. Agriculture therefore owes to the desert conditions of the Permian Period one of the chief materials needed for the re-fertilisation of soils exhausted by long cultivation.

The peculiar conditions of the Permian Period also led to the formation of some important ore deposits. The wearing down of the mountains exposed lodes of copper, lead and zinc, and grains of these ores were washed down the mountain sides and deposited in beds of sand and sandstone. These grains were subsequently dissolved by water percolating through the sandstones and re-deposited as copper and lead ores, which also contain silver, zinc and cobalt. The concentration of the metals in these ores has rendered practicable their recovery by mining in such fields as those of Mansfeld in central Germany and of Alderley Edge in Cheshire.

The rocks formed in the Permian deserts of north-western Europe were predominantly coarse sandstones with beds of shale laid down by occasional floods of water

after bursts of rain, and thicker shales associated with salt and gypsum on the site of vanished lakes

and lagoons. In other parts of the world the Permian rocks are more extensive and less abnormal. Thus, in Russia, northern India, south-eastern Asia and Australia the Permian System is represented by three different subdivisions and includes many marine rocks deposited in the open sea. The classification of the Permian System has therefore to be determined in those countries.

The southern hemisphere during the later Carboniferous and Permian Periods had an arrangement of land and water quite different from that of the present day. There were in the world two great continents, each of which had its own special vegetation. The northern continent extended from Asia across Europe to North America; the southern continent, which is known as Gondwanaland, included most of Australia, India and Africa and the whole of Brazil, and it extended across both the Indian Ocean

and the South Atlantic. The extent of the southern continent is proved by its flora, of which the characteristic member resembled a tree fern, known as *Glossopteris*. It and its associated plants range from eastern Australia to western Brazil.

The northern land was occupied by a different vegetation, which is well known, since the trunks, foliage and roots of its great forest trees are found with smaller plants

in the coal seams. The characteristic tree of the northern continent is *Sigillaria*, in which the stem was vertically fluted like a Greek column. An allied tree had the stem cut up into lozenge-shaped areas by a network of grooves. This type is known as *Lepidodendron*. The northern *Sigillaria* and the southern *Glossopteris* floras kept in the main distinct, so that their range eastward and westward must have been by separated lands. This may be seen in the map of the world in Early Permian times, in the plate facing page 96.

The geographical changes which converted the rank forests of the Carboniferous Period into the deserts of the Permian produced also a great change in the life of the world. The deepening of the ocean basins at one time and their shallowing at another led to great changes in the distribution of ocean and continent and in the conditions of the sea water. Many highly specialised and decrepit types of life were exterminated as they could not readily adapt themselves to their new environment; while the stimulus of the change led the more adaptable creatures to rapid evolution into new types. Hence, during the Permian Period many animals characteristic of the Era of Ancient Life, such as the trilobites, became extinct; and other groups were continued by modifications adapted to the fresh conditions.

On the life of the land the geographical changes were still more influential, and their stimulus led to the evolution of the reptiles. The original change from the land-living amphibian to the reptile was a comparatively simple stage and had probably been made while the Altiid movements were in progress, for when the deposition of beds was resumed in Britain,

the earliest of them contained the teeth and bones of reptiles.

After that change the reptiles soon developed into many different kinds and in the next period, the Triassic, one section of them gave rise to the mammals. The change in life was so important that the



THE RIVERS OF TRIASSIC BRITAIN

Throughout Triassic times the British Isles were part of a land area with basins of inland drainage, receiving salt from these rivers in wet periods and depositing it in times of drought.

After Jukes Brown, Building of the British Isles

end of the Permian Period marks the end of the Era of Ancient Life and the beginning of the Era of Middle Life. That great advance in the earth's history is marked at the divide between the Permian and the Triassic.

The desert conditions of north-western Europe and of parts of eastern North America became still more extreme during the Triassic Period, and it was then that the most important of the British salt beds were formed. The Permian inland sea disappeared, and the sea in Europe was limited to the Mediterranean area and the Southern Alps, except for a short extension northward in the middle of the Trias into Central Germany. Numerous salt lakes were in existence, and they probably received their salt from, the

solution of Permian beds. The evaporation of the lakes produced the salt deposits which have made Cheshire and the English Midlands the chief centres of the British chemical industries.

The desert condition of England at this time was probably due to the continued existence of the Western Altiid mountains, which trended across Europe from east to west, and were continued across the Atlantic, since they reappear in the Maritime Provinces of Canada.

The succeeding period is known as the Jurassic. The deserts of the Trias were gradually reduced in area by successive advances of the sea upon the land and the development of a moister climate. The submergence happened simultaneously in so many parts of the world that the only satisfactory explanation of the facts is that the ocean basins were gradually reduced in size by the raising of their floors. As the basins became shallower their water was forced to spread on to the land. These widespread marine transgressions happened time after time throughout the two later periods of the Era of Middle Life. The red clays of the Trias pass gradually upward into green and dark blue shales which contain marine shells. Those that appeared first had stunted forms, as they lived under unfavourable conditions; but as the sea spread over the British Isles it was inhabited by a rich normal marine fauna, the fossils of which are found abundantly in the clays deposited on the sea floor.

In later times, after the submergence of the land, large tracts of country were covered by a clear warm sea, in which grew coral reefs and shell-fish whose remains have accumulated as beds of limestone. Some of these limestones consist of small rounded grains, so that they look like the hard roe of a fish, and are therefore known as roestone, or oolite. These oolitic limestones provide some of the most ornamental of English building stones, which are serviceable everywhere except in the corrosive atmosphere of manufacturing cities. On some of the muddy floors of the sea small grains of carbonate of iron were formed, and they have in places accumulated as beds of valuable ore; the oolitic ironstones of

Cleveland in Yorkshire provide the raw material for the iron industry of Middlesbrough, while the ironstone of the same age in Lorraine forms the largest reserve of iron ore in Europe.

The system which includes these oolitic limestones and ironstones derives its name from the fact that its rocks are well developed in the Jura Mountains of Switzerland. In the Mediterranean and tropical seas the limestones of this period are still more abundant.

The end of the Jurassic Period was accompanied in many parts of the world by violent earth movements and volcanic disturbances, which were contemporary with a gentle uplift in the British area. A long belt of country in the western hemisphere was crumpled and formed the foundations of the western mountains of North America and of the Cordillera of South America. These movements were accompanied by great volcanic disturbances, while solutions arising along fractures in the crust brought up the gold of some of the goldfields of California and other parts of western America.

At the end of these disturbances followed another time of fairly quiet development; it is known as the Cretaceous Period, because its characteristic rock is the chalk, the white cliffs of which gave England its name of Albion. This period was attended by further transgressions of the sea upon the land, until the chalk sea extended across Europe from Ireland to the Crimea. The chalk deposited on the floor of this ocean supplies the world with vast quantities of soft earthy limestone, which is of great value for making Portland cement; while some layers in it contain phosphatic grains which, in France, Belgium and Russia, supply phosphatic manures. Within the chalk were also formed nodules and veins of the flint from which early man made his tools.

The Jurassic and Cretaceous Periods both witnessed further progress in the life of the world. The dominant animals were the reptiles, which were supreme on land, in water and in the air. The mammals still remained small and unimportant as they were unable to compete successfully with the powerful reptiles; but at the end of the Chalk Period the mammals

must have improved in wiliness, for they then replaced the reptiles as the dominant class of animals, while the birds, which developed later than the mammals, replaced the reptiles in the air.

At the end of the Cretaceous Period there followed another of the great revolutions in the surface of the Earth leading to the Era of Recent Life. The break between the two eras was due to a world-wide disturbance, as the slow movements from the Trias to the Chalk had rendered the crust weak and unstable. It recovered strength and stability by rapid changes, during which blocks of the crust foundered, forming parts of the Indian Ocean and South Atlantic and causing volcanic eruptions on a colossal scale. An area of about half a million square miles in and to the west of India was covered with lava, and at about the same time or shortly afterwards lava floods deluged eastern equatorial Africa and south-eastern Australia. The subsidences did not fully re-establish the equilibrium of the crust, and belts of it were folded by compression into mountain chains.

The folding which made the Alps had begun gently during the Era of Middle Life, but the movements became more



FLORA OF A TROPIC ENGLAND

Fossil palms, like this Eocene feather-palm from Bournemouth, show that the south of England at the beginning of the Era of Recent Life enjoyed a climate far warmer than that of to-day.

From British Museum, Natural History

intense after the time of the Chalk, while the active upheaval of the Pyrenees and the Caucasus began somewhat earlier than the Alps. This disturbance of the Earth's surface culminated in the middle of the Era of Recent Life, when a great crustal storm formed all the main existing mountain chains, including the Alps, Pyrenees, Carpathians, Atlas, Caucasus and Himalayas, and, by a further uplift, the chief mountains of western America also (see map in page 85).

After the compression of these narrow, intensely folded belts had ceased the chief movements of the crust were the gentle heaving of the surface as some areas of hard rocks were slowly raised into broad domes or long arches, and the adjacent regions sank below sea level. The upper surface of the uplifted areas was stretched and torn by networks of fractures, which now form the fjord systems of the world, such as those of Norway.

The great changes produced by the geographical revolution of the middle part of this Era re-established great differences in relief on the Earth's surface, and therefore led to great climatic extremes. At the beginning of the Era of Recent Life the range

Crocodiles and of level on most of the
Palms in England land was comparatively gentle, and the climatic differences were moderate. Many areas had a warmer climate than at present. The mouth of the Thames was then the estuary of a great river from the south which flowed through forests of palms and was inhabited by crocodiles and turtles. Fossil palm fruits are so abundant in the Isle of Sheppey that the land through which this river flowed must have had a luxuriant growth of palms and a tropical climate.

During the Era of Recent Life the climate of the British area became gradually colder. By the time of the great volcanic disturbances of the north-west of Scotland, which at Mull and Skye built up volcanic mountains as high as Etna—and over 10,000 feet above sea level—the palms had been replaced by trees which live in a colder zone. Shells that now inhabit only warm water still lived in the south of England, but they disappeared one by one

and were replaced by shells of a northern type. The long continued gradual refrigeration of the climate culminated in the Great Ice Age, during which there was a great extension of snow fields and glaciers in many parts of the world. The snow on the British mountains fed glaciers which flowed down the valleys, spread over the lowlands, and in places discharged to the sea. The glaciers existed as far south as South Wales.

The English plains were then inhabited by herds of woolly rhinoceros, the mammoth, the Siberian or Saiga antelope, the reindeer, the musk ox and other animals adapted to a cold climate. Several times the glaciers became smaller and the climate warmer, and during these mild inter-glacial intervals England was invaded by southern animals, including the hippopotamus, hyena and cave lion.

At about the same period a great ice-cap covered Scandinavia, and ice-caps existed in different parts of North America; the last of them still covers nearly the whole of Greenland. While these glacial conditions ruled in the northern lands, southern Europe and some of the desert parts of Africa had a wetter climate than they have to-day, as the storms which now traverse central Europe were deflected southward along the Mediterranean Basin.

The warm moist climate of the sub-tropical or tropical parts of the Old World, southern Europe, northern Africa or southern Asia, favoured the development of one of the higher groups of monkeys into an animal of superior intelligence and erect habit, and shortly before the glacial period a tool-using animal became the parent of Man.

The metallic ores derived from the interior of the earth, the secondary rocks that provide building materials, pottery and fertilisers, the organic products that supply coal, oil and lubricants, have been rendered accessible to Man by the earth movements that have time after time devastated the earth's surface. The processes of destruction and construction acting through the aeons of geological time have combined to prepare the world as the home of Man.

LIFE ON EARTH BEFORE MAN

A Short Study of the Fossil Remains disclosing the Evolution of Animal Forms preceding Human Life

By D. M. S. WATSON F.R.S.

Jodrell Professor of Zoology and Comparative Anatomy, University College, London

IN the preceding chapter there have been described some of the changes by which the earth, at first a molten mass, acquired a solid, red hot crust, surrounding a liquid core and itself surrounded by steam; and then by slow cooling at last reached a stage in which oceans were formed by the condensation of the steam, and the irregular granite mountains were for the first time attacked by rain and rivers. From this point the geological record begins.

Eventually the rocks begin to show traces of life; but the story of the earliest forms, the invertebrates, is so wrapped up with the geological record that for them reference must be made to the previous chapter. In this chapter I propose to follow the long history of those animals which, from having a backbone, are known as the vertebrates, and to show how group succeeded group, each higher in its structure than that which it displaced, until Man himself and the animals which he has domesticated came into existence. (This evolutionary sequence may be seen schematically displayed in the colour plates facing page 96 and in Chapter 5.)

Palaeontology, the science dealing with the history of life, depends for its knowledge on the remains of animals and plants that have become buried in the muds and sands which the rivers are continually bringing down to the sea, or else on land in the bottoms of ponds, in sandhills or in the fine dust which, blown about by the wind, has gradually built up the great plains of North and South America and of China and Mongolia. Once safely buried in such mud and sand, a shell or a bone may be preserved for millions of years in a condition as capable of interpretation by an anatomist as if

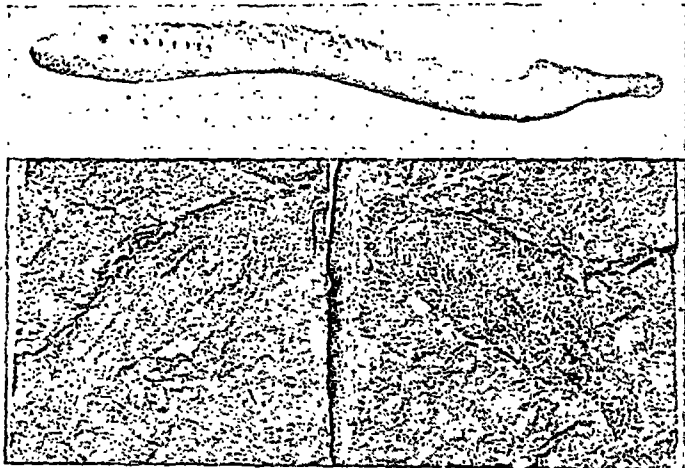
it had been picked up on the beach at the present day.

When the whole skeleton is preserved in place it is possible for a sufficiently experienced palaeontologist to make a restoration of the animal of which it once formed a part. Such restorations may give us an accurate idea of the general form of an extinct animal, but cannot tell us anything about the character of its coat, whether there was or was not a mane or whether the tail was bushy or slender; nor can they tell us anything about the colour of the creature. But, despite their shortcomings, these restorations are of great interest, because they do allow us to gain an idea of the mode of life of the animal—whether it lived in trees like a monkey or in the water like a hippopotamus; whether it inhabited bare plains or forests; even whether it lived in herds or in separate families.

The oldest vertebrates known are represented by little fragments of bone from the Ordovician strata of Canyon City, Colorado, U.S.A.; but the first remains which are well enough preserved to enable us to know much

First animals
with Backbone

about them come from the top of the Silurian rocks of Scotland and Norway. One of the best known is called *Birkenia*. These lived in fresh water, perhaps coming down into the wide estuaries and sometimes, though rarely, even into the sea. They are little, fish-like creatures with their heads and bodies covered all over with an armouring of hard scales about the size of small grass seeds. But they lacked the two pairs of special fins which lie on each side of the body of true fishes and enable them to rise and fall in the water as they swim along, and to make small adjustments of



FIRST CREATURE TO ACQUIRE A SPINE

The first backboned animals of which we have any knowledge were almost, but not quite, fish—their closest living representative is the lamprey (above). One of the earliest, *Birkenia*, was covered with parallel rows of tiny scales. The fossil is in two halves because the Silurian shale has split lengthwise.

From British Museum, Natural History

their position. Thus their movements must have been clumsy and ill-directed, although their modern descendants, the lampreys, swim well enough to be able to fix themselves on to the salmon and other fish on which they are parasites.

Closely related to these are other fish-like creatures, of which the first found was *Cephalaspis*; they are of interest because they were the first vertebrates to be cased in armour-plate. They had the head and the front of the body covered with great plates of bone, or some similar material that formed a rigid coating, behind which projected a small flexible tail by means of which they swam. The whole group is known as the ostracoderms, and they illustrate a type of change which has occurred time after time in the evolution of life.

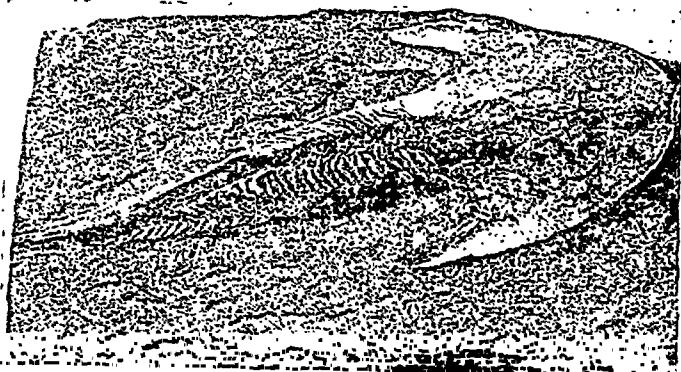
Beginning as little animals of an ordinary fish-like form, they were unprotected from their enemies except by their speed of movement; as time passed they grew larger and larger and became grovelling forms, living on the bottom and protected by a heavy armouring. But this form of defence always proves un-

availing; finally, the group that adopts it ceases to be of importance in the economy of the world, and is replaced by a series of animals of higher and more efficient structure.

The creatures which replaced the ostracoderms in the fresh waters of the world were real fishes, but fish entirely unlike any that are still living, although they were remotely related to the sharks and skates. One group of them—*Climatius* is an example—was remarkable because its members had two rows of little fins, one on each flank, in addition to fins on the back, and each of these fins consisted of a flap of skin

supported by tall spines in front, just as the jib of a boat is carried aloft by the mast. Like the ostracoderms, they became larger and more heavily armoured, until, in the case of a fish which lived at the bottom of the rivers and pools intersecting the coal forests, the biggest fin spines might be nearly two feet and the whole creature perhaps six feet in length.

But living side by side with these spiny fish there was another group of armoured fish, in which, as in the ostracoderms, the front half of the body was protected by great bony plates, the



HOW 'SHIELD-HEAD' PROTECTED ITSELF

In the Devonian successors of *Birkenia* we find each row of small scales united into a narrow plate with bone-cells in its lower layers, a feature that has given the title Ostracoderm ('Shell-skin') to the whole group. *Cephalaspis* had its eyes set close on top of the shield-like head which gives it its name.

From British Museum, Natural History

biggest being more than a yard across and two inches thick. Yet even these giants, fifteen feet in length and provided with cutting blades acting like a pair of scissors in their mouths, proved incapable of meeting the competition of more modern fishes, and they in turn died out at the end of the Old Red Sandstone times.

The rivers in which the Old Red Sandstone fishes lived, like many of those of South Africa to-day, were seasonal, running only during the wet season or after rare torrential rains. During the rest of the year they dried up, being reduced first of all to isolated pools and then disappearing altogether, except that their course was marked, perhaps, by green vegetation along its banks. These rivers fed great, shallow lakes inconstant in their extent and depth, like Lake Chad to-day, and in them were laid down the 'flagstones' from which so many specimens of fossil fish have come.

Geographical conditions of this sort seem to have been responsible for that change in the habits of the vertebrates to which we owe our existence. The water in the stagnant pools of rapidly shrinking rivers becomes deprived of oxygen, and a fish is asphyxiated in it just as we are when deprived of the oxygen of the air we breathe. But although the water



SHARK-LIKE : AN EARLY FISH

Alongside the latter ostracoderms true fish were living, and some of them, too, evolved a coat of armour. *Climatius*, for instance, a member of the Acanthodian order, had tough fin-spines.

of these lakes lacked oxygen, there was an unlimited supply in the air, and some of the fish, instead of dying in the water, began to supplement their supply of oxygen by swallowing air. This habit, which is actually seen in some Indian fish living to-day under similar conditions, led to the formation of a special little pocket in the gullet into which a bubble of air could be passed, for the oxygen to be extracted from it while the useless residue was expired. In this way a lung came into existence.

The fish which developed lungs soon split into two groups, distinguished from

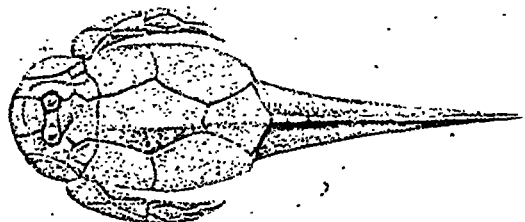
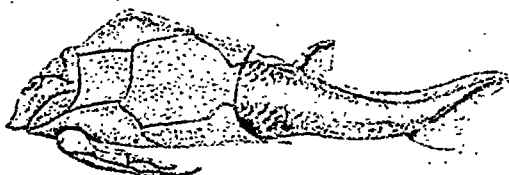
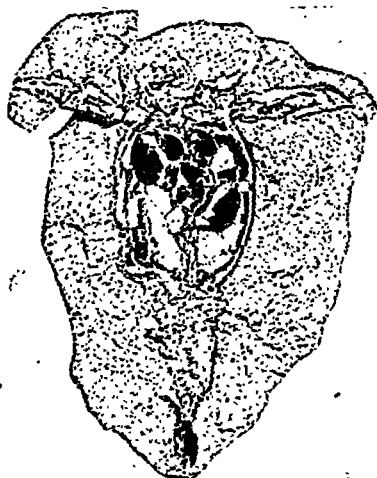
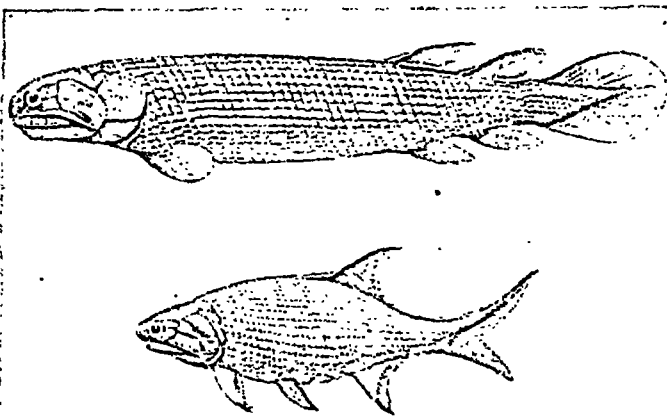


PLATE-ARMOUR THAT HELPED BUT LITTLE IN THE FIGHT FOR SURVIVAL

Heavy armouring in the animal world, whether cause or effect, seems to accompany stagnation, and extinction often ensues. This ostracoderm (*Pterichthys*—'Wing-Fish') travelled farther down the fatal road than *Cephalaspis*, and had head, trunk and paddles heavily protected with symmetrical overlapping plates, only the short tail protruding (see reconstructions, from above and one side).

From British Museum, Natural History



HOW TWO GROUPS OF FISH DIVERGED

These reconstructions show the difference between the two groups into which the fish with lungs developed. *Diplopterus* ('Double-Wing'), above, had little use for a tail, and swam by movements of its body; whereas *Elonichthys* (one of the *Palaeoniscidae*, or 'Ancient-Cod') used its tail like a propeller.

each other by the way in which they swam. In the first group, which we will call the fringe-finned fish, the tail was a mere extension of the body, enabling its members to swim by throwing their bodies into waves, while the paired fins became so freely movable that they could be used not only as paddles to move the fish in any direction, but even as legs by which their owners could walk along the bottom of the lake. Of these fish, called collectively the *Osteolepids* or *Bony-scales*, *Diplopterus* is a good example.

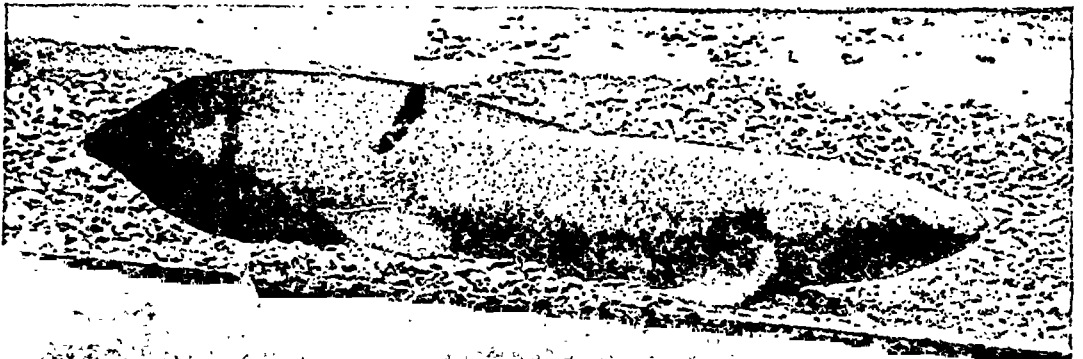
In the other group, the *Palaeoniscids*, the tail became in effect an appendage to the body which could be flapped from side

to side and rotated so that it acted like a screw propeller, or, more accurately, like an oar over the stern of a boat. The paired fins remained for a long time as stiff lateral projections, like the diving planes of a submarine, and indeed have never attained the flexibility and adaptability of those of the former group. The members of the latter group made little use of their lungs, perhaps because they soon migrated into the sea, where there is always as ample a supply of oxygen as in the air itself. From them arose the sturgeons, and also, in later times, the ancestors of

all the familiar bony fish—salmon, herring and turbot alike.

The fringe-finned fish which possessed lungs, however, soon split up into three smaller divisions. One of these took to eating hard food, such as pond-snails and mussels, which had to be crunched before being swallowed. Of this division only three kinds still survive, one in the rivers of Brazil and Paraguay, another in tropical Africa, and the third, *Ceratodus*, inhabiting two small rivers in Queensland.

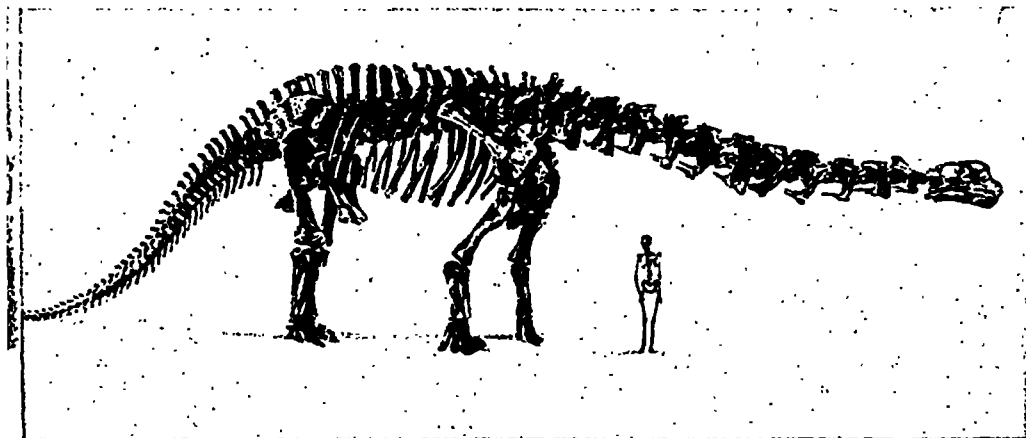
Ceratodus is, in a certain sense, the oldest of all living vertebrate animals; it differs exceedingly little from its ancestor which lived in the Coal Forest pools



LUNG-FISH THAT LIVES TO-DAY IN TWO AUSTRALIAN RIVERS

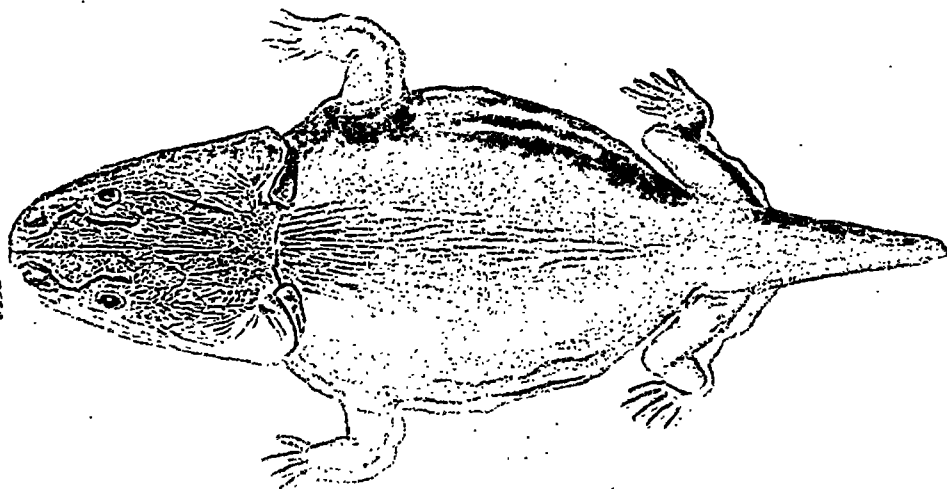
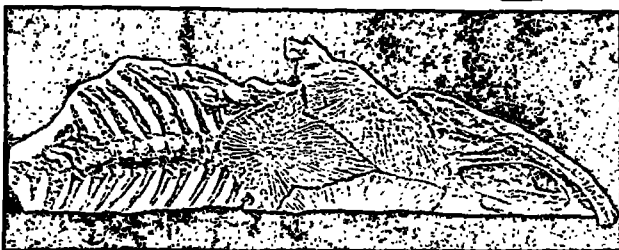
How did Life first leave the water? Fortunately there are fish living to-day whose ancestors of the Coal Forests took the first step and then progressed no further, thus letting us into the secret. One of these is the *Ceratodus* ('Horn-tooth'), or *Barramunda*, of Queensland, which extracts oxygen from the water with gills, like other fish, but, can also rise to the surface and breathe with a lung.

Photo, *The Times*



The dinosaurs of Mesozoic times were the fine flower of reptilian creation ; but they had a great variety of form. Brontosaurus (' Thunder-Lizard ') belonged to those called Sauropoda, or lizard-footed, which were the biggest quadrupeds known, some being 100 feet long ; the human skeleton gives the scale.

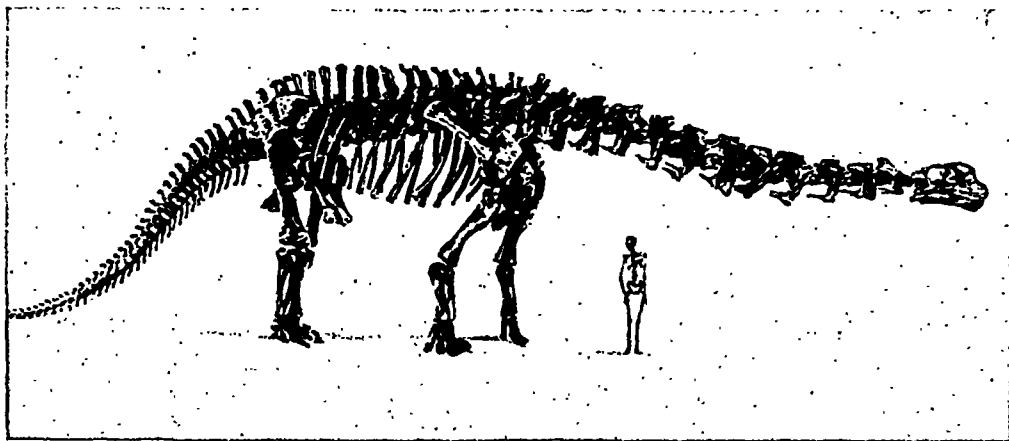
which we believe have been reptiles, the first group of vertebrates to become so completely terrestrial as to be able to carry out the whole of their development on land. They did so, in effect, by wrapping up their spawn, together with a supply of



MOST UNGAINLY ANIMAL THAT HAS EVER BEEN EVOLVED

Reptiles coexisted with Cacops ; and it was probably to escape these more efficient rivals that certain terrestrial amphibians took the strange step of going back to the water again—or rather never leaving it. In effect, they remained in the tadpole stage of their existence, a modern instance being the Axolotl. The result was a weird creature, as shown by this reconstruction of Metoposaurus (' Face-Lizard '). Its fossil (above) was found in a door-step, and is in the Stuttgart Museum.

Reconstruction after Fraas



The dinosaurs of Mesozoic times were the fine flower of reptilian creation ; but they had a great variety of form. Brontosaurus (' Thunder-Lizard ') belonged to those called Sauropoda, or lizard-footed, which were the biggest quadrupeds known, some being 100 feet long ; the human skeleton gives the scale.



ONE OF THE VASTEST OF THE QUADRUPEDS : SLUGGISH BRONTOSAURUS

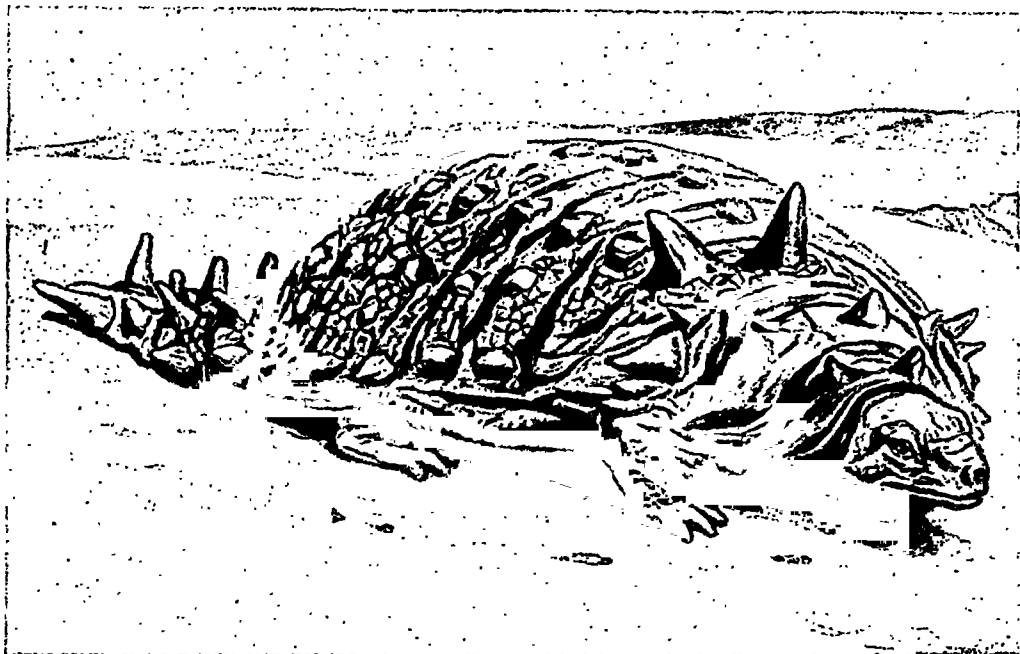
Its teeth show Brontosaurus to have been a vegetable feeder—indeed it was obviously too unwieldy for a carnivorous life. It may sometimes have walked dry land, but probably spent most of its time like the nearer one in this reconstruction, with its long neck projecting from shallow estuaries.

The photos of skeletons and reconstructions in pages 121, 122 and 124 to 128 are reproduced by courtesy of the American Museum of Natural History.



HORNED BROWSER ON THE MESOZOIC PLAINS LESS LIKE A REPTILE THAN A MAMMAL

Some of the land dinosaurs were built on lines more like those of modern mammals; on looking at Monoclonius shown here it is hard to realize that it is truly a reptile and not a sort of rhinoceros with a frill round its neck. The frill is a stout bony plate, and it is the possession of such plates that gives the name Stegosauria ('Plated-Lizards') to this class of dinosaurs. Monoclonius had a single horn; an allied form, Triceratops seen in page 125, had three.



HEAVILY ARMoured AGAINST THE HUNGER OF CARNIVOROUS RELATIVES

The last word in armoring was achieved by a type of dinosaur that was probably insectivorous and lived in arid regions. The specimen reconstructed above (some 12 feet long) was dug up in Alberta, Canada. What makes the reconstruction so certain is that much of its skin was preserved.

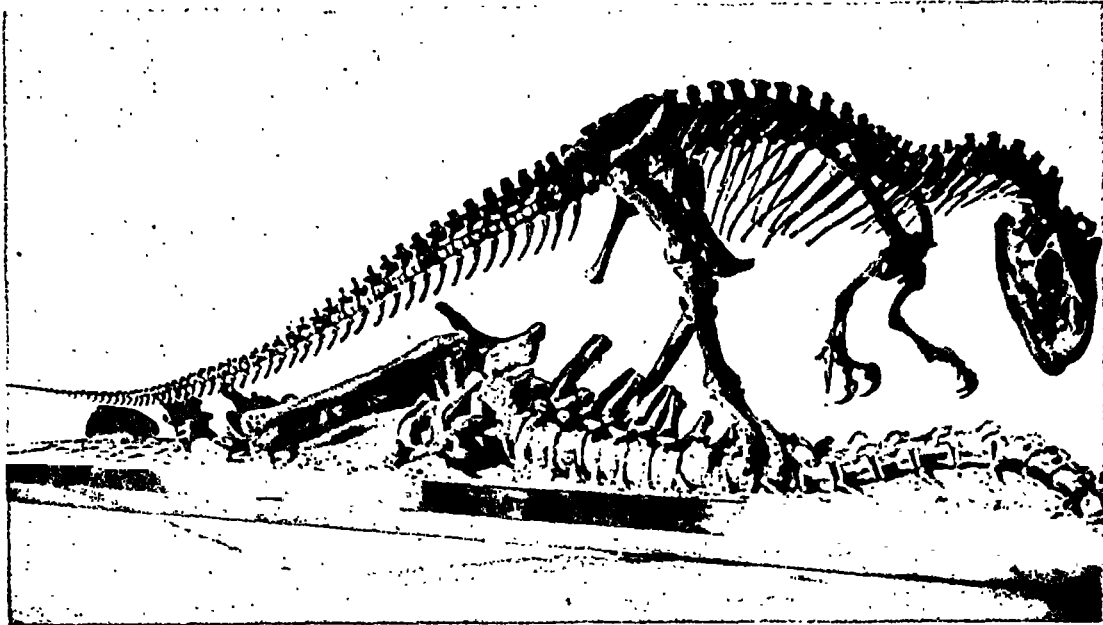
Courtesy of Prof. D. M. S. Watson.



PROOF THAT DINOSAURS LAID EGGS : A CLUTCH THAT NEVER HATCHED

Modern reptiles lay eggs, and it was assumed that the extinct dinosaurs did so too. Positive proof, however, was lacking until their actual eggs were found in 1923 fossilised in the deserts of Mongolia, arranged in neat circles just as left by the female—an ancestress of *Monoclonius* in the opposite page.

From Roy Chapman Andrews' On the Trail of Ancient Man, by permission of Putnam's, Ltd.

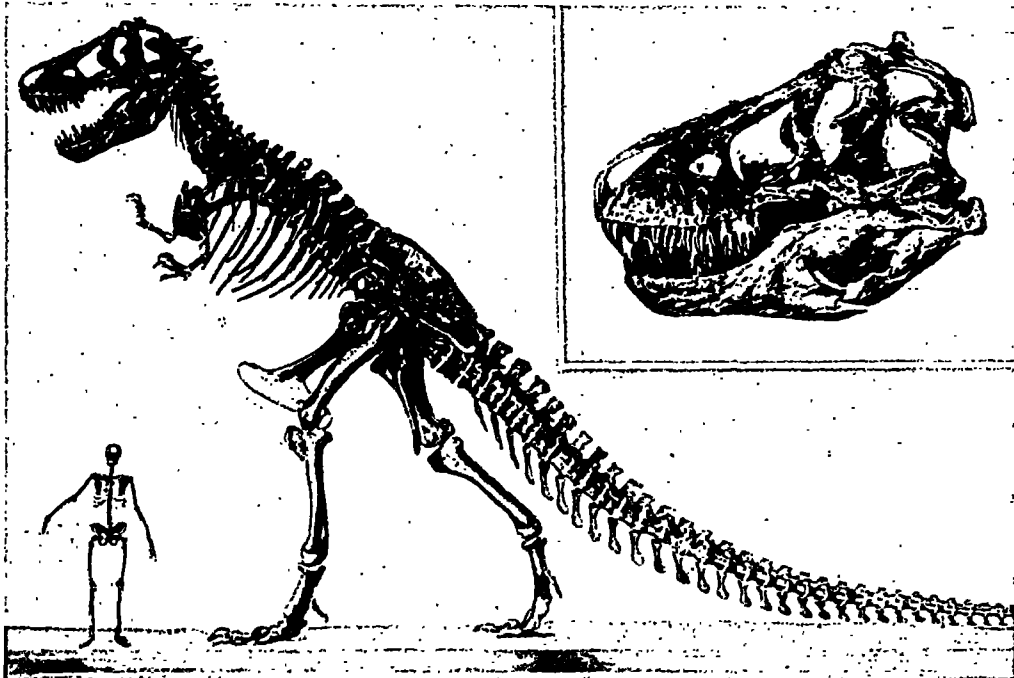


Contrasting strongly in their build with the sluggish quadrupedal dinosaurs were the beast-footed types (Theropoda), agile and light-boned and walking on their hindlegs like a kangaroo; their forelegs were very under-developed. Allosaurus is here mounted in the attitude of devouring its prey.



FERCE ALLOSAURUS GLOATING OVER ITS MANGLED VICTIM

This reconstruction of Allosaurus is based directly on the mounted skeleton shown above; it is not fanciful, for the victim's bones were scratched and scored, and broken Allosaurus teeth found near by. The forelegs, small though they were, ended in sharp claws that could rip and tear animal food.

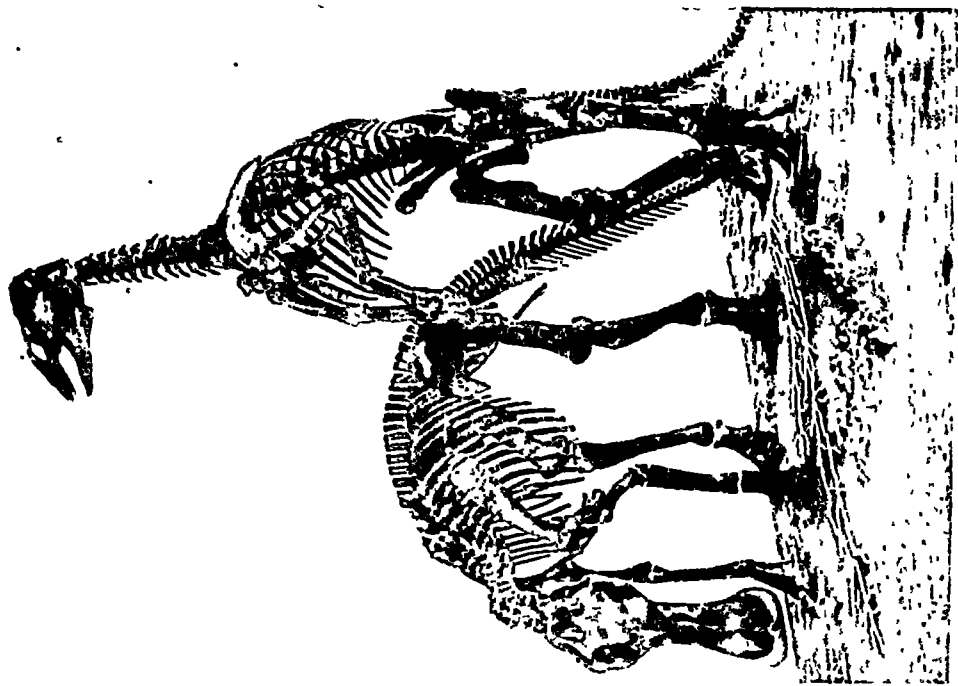


Another carnivorous dinosaur was Tyrannosaurus ('Tyrant-Lizard'), over 40 feet in length including the tail. Its jaws were furnished with terrible sabre-like teeth, as shown by the inset head; for this gigantic maw a man, had he unluckily lived in the Mesozoic Era, would just have made a mouthful.



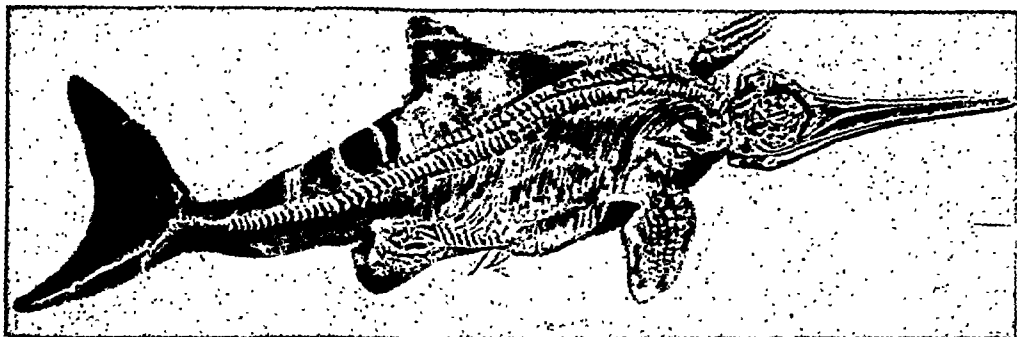
TYRANNOSAURUS ADVANCES TO ATTACK ITS FELLOW-REPTILES

Tyrannosaurus had forelegs even more stunted than those of Allosaurus, but this can have done little to mitigate its fearsome appearance. The reptiles with lowered horns rashly awaiting it are two specimens of Triceratops ('Three-horned-face'); but the result of the fight cannot be in doubt.



UNCOUTH DUCK-BILLED CREATURES THAT WALKED THE MARSH-LANDS MANY MILLION YEARS AGO

Some of the herbivorous dinosaurs walked on two feet like the carnivores, only using the forefoot to support the body when feeding; they are known as the bird footed class (Ornithopoda), owing to the ostrich-like structure of their hindlegs. 'Trachodon' ('Rugged-tooth'), here shown in skeletal and reconstructed form lived in Cretaceous times and was some 34 feet long. It is noteworthy for the prolongation of the jaws, giving it the appearance of a duck-billed platypus



Two orders of reptiles unconnected with the dinosaurs, the Lizard-finned and Fish-finned, took to the seas quite early in Mesozoic times and became as adapted to their environment as the mammalian porpoises. This skeleton of Ichthyosaurus ('Fish-Lizard') shows how the feet became paddles.

Courtesy of Prof. J. W. Gregory.



REPTILE THAT WAS PERFECTLY AT HOME IN THE SEA

A most interesting fact about Ichthyosaurus, one of the Fish-finned order, is that it brought forth its young alive instead of laying eggs—this we know from a specimen found near Württemberg with six embryos within the cavity of the ribs. Plesiosaurus is the best known of the Lizard-finned order.



COMBAT BETWEEN TWO MAMMALS OF THE OLIGOCENE PERIOD

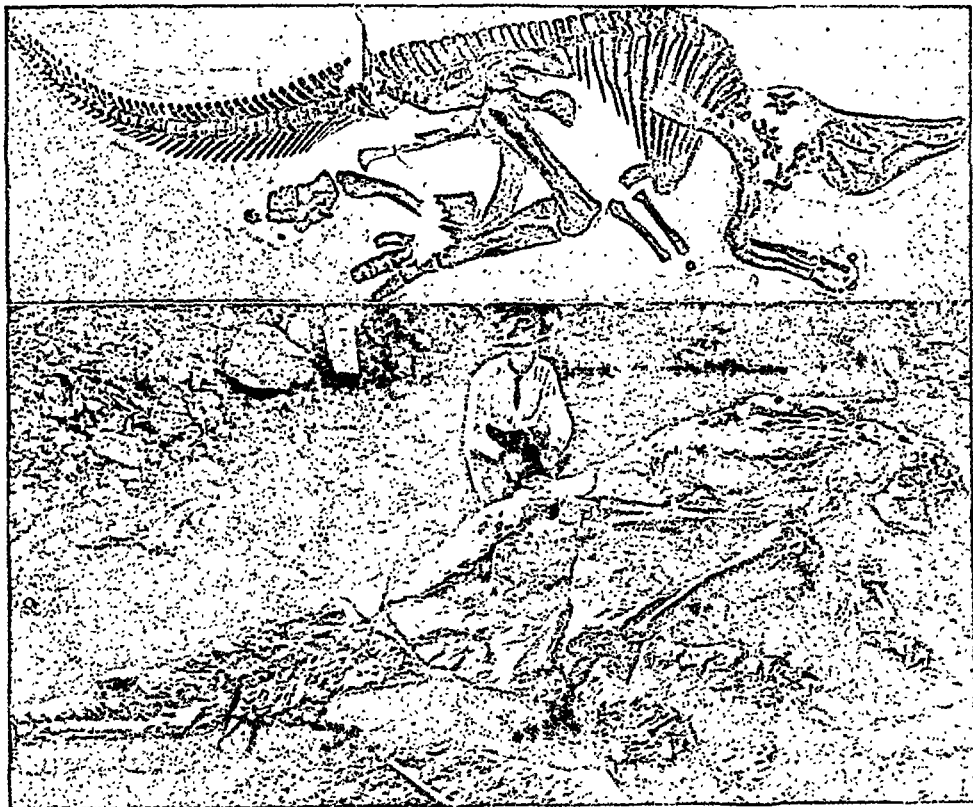
When the reptiles passed away at the end of Mesozoic times their place was taken by the mammals, some of which were hardly less monstrous than their predecessors. *Arsinoitherium*, here shown at bay before a pack of extinct hyaenodonts, was confined to Africa, and has no modern representatives.

they do now. Throughout the whole of Mesozoic time they remained small, none of them as big as a cat, living perhaps mainly in trees, while the land, the sea and the air were alike possessed by reptiles. These were the descendants of creatures which, living alongside the ancestors of the mammals, were in no way closely related to them, and became fitted for the most varied types of life in quite different ways.

The most remarkable are the dinosaurs, a group which included the largest land animals that have ever lived. Of these there were three main types. First there were the giant herbivores, such as *Trontosaurus*, reaching a length of some eighty feet with a weight of thirty-five tons, who spent their lives wading about in the estuaries of rivers and in the sea along the

coast. They scooped up seaweed with their inadequate teeth and were capable of reaching up to a height of about thirty feet, so that they could breathe even when walking on the bottom in water of that depth.

Secondly on the land, even in the arid plains which then existed in Mongolia, there were other herbivorous forms, some, like *Trachodon*, resembling giant kangaroos in shape and walking on their hind legs alone, while others walked on all four legs and carried a heavy armour of bony plates along their backs, like *Stegosaurus*. Others, again, though free from body armour, had horns on their heads and a great bony frill projecting over their necks; it was an animal of this kind, *Monoclonius*, that laid the eggs first found in 1923 by the American Museum's expedition in the



HOW SCIENCE RESTORES CREATURES THAT LIVED MILLIONS OF YEARS AGO

Reptiles had not really mastered their environment before the Secondary Era, during which the dinosaurs were lords of creation. Compare the obviously agile and highly specialised creature above (*Saurolophus*—'Crested Lizard') with clumsy *Pariasaurus* in page 119. Below *Corythosaurus* ('Helmet-Lizard'), a closely allied form, is being exhumed from its Cretaceous bed; often it takes months of patient labour before the bones can be freed from the surrounding rock and mounted.

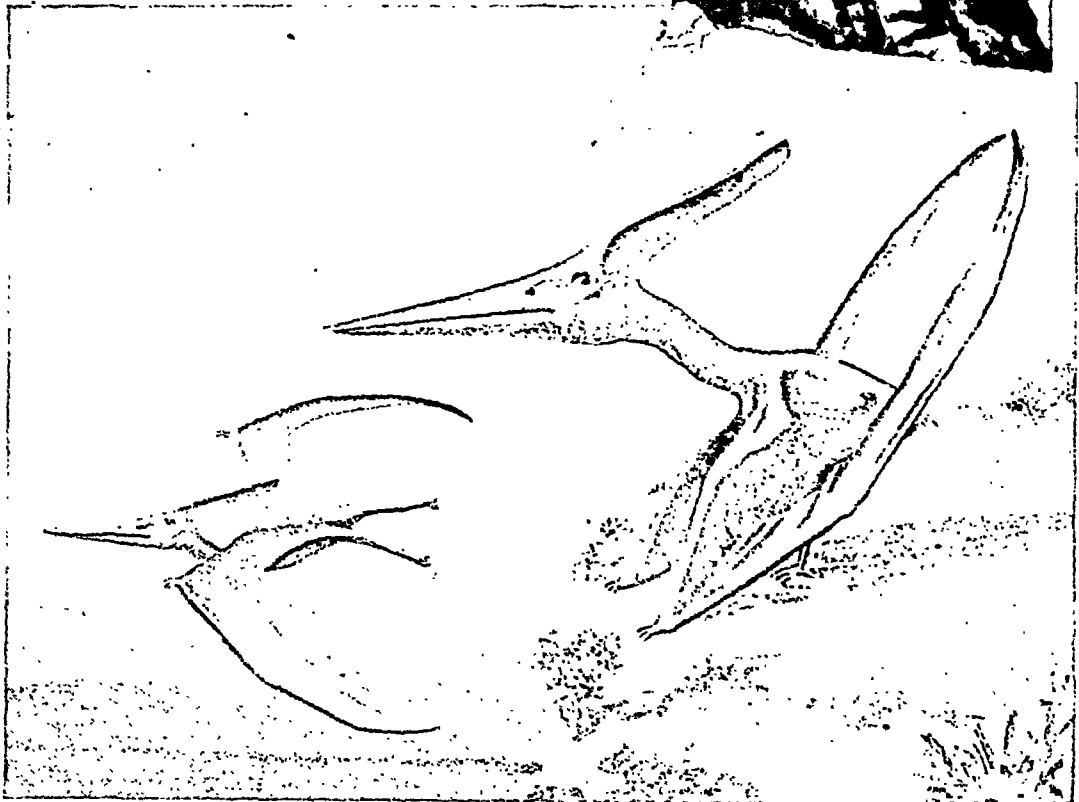
Photo by Barnum Brown, courtesy of American Museum of Natural History

shallow nest scooped out of the ground, very like that of the ostrich.

The chief enemies of these creatures were the third type, the carnivorous dinosaurs, all kangaroo-shaped, and of all sizes from that of a hen to a monster called *Tyrannosaurus*, standing some fifteen feet high and more than thirty feet long.

From the same stock as the dinosaurs arose the flying reptiles, the pterodactyls, which became so perfectly fitted for life in the air that many of them, such as *Pteranodon*, lived like the seagulls and albatrosses, by catching fish, even on the high seas far from land. This we know, in the case of *Pteranodon*, from an examination of the joints of the fore-arm which supported the creature's leathery wing. The amazing fact emerges that the wings could never have been properly folded, so that it was impossible for it to

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HOW PTERANODON LAUNCHED ITSELF FROM THE EDGE OF A CLIFF

Pterodactyls, though perfectly adapted for flight, were not birds—they were really a kind of dinosaur that had grown a leathery membrane between foreleg and hindleg. But to achieve lightness they acquired many features in common with the birds after them; their bones, for instance, were hollow tubes made strong with internal struts. *Pteranodon* had a strange crest on the head.

Reconstruction from material supplied by Prof. D. M. S. Watson

they do now. Throughout the whole of Mesozoic time they remained small, none of them as big as a cat, living perhaps mainly in trees, while the land, the sea and the air were alike possessed by reptiles. These were the descendants of creatures which, living alongside the ancestors of the mammals, were in way closely related to them, and became fitted for the most varied types of life in quite different ways.

The most remarkable are the dinosaurs, a group which included the largest animals that have ever lived. Of these there were three main types. First were the giant herbivores, such as *Brontosaurus*, reaching a length of some 100 feet with a weight of thirty-five tons. They spent their lives wading about the estuaries of rivers and in the sea.

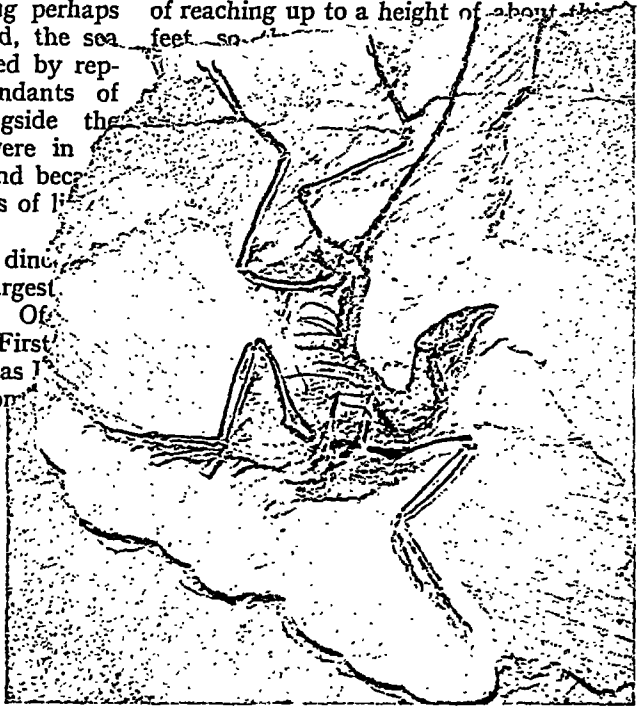


no bigger than a sheep—fore-runners of the great mammalian fauna which ever since has populated land and sea and even passed on to live in the air.

The lands on which these mammals underwent their evolution had a geography very different from that familiar to-day, and the distribution of land and sea has only slowly become that which we know. Nevertheless there are certain parts of the world which are stable, regions that have been land throughout the Tertiary Period and even from times long before that. These regions, eastern Canada, Mongolia, Central and South Africa, Brazil and Western Australia have always formed parts of continents, varying in size from age to age, but always serving as evolutionary centres wherein mammals underwent their evolution and familiar animals came gradually into existence.

Australia was the evolutionary centre of those animals which still occupy it and which are so far peculiar to that continent that none of them has been able to migrate farther than New Guinea. The

coast. They scooped up seaweed with their inadequate teeth and were capable of reaching up to a height of about 10 feet so



BIRD THAT WAS HALF A LIZARD

Even modern birds are lizard-like in many ways, and we can have no further doubt of their origin from reptiles when we find fossil creatures with teeth as well as beaks, and fingers as well as feathers on their wings. *Archaeopteryx* ('Ancient-wing') was discovered in Jurassic strata of Bavaria.

From the original in the Berlin Museum

kangaroos, the wombats, the Tasmanian devil and wolf are purely Australian, playing no part in the history of the rest of the world because Australia has been sundered therefrom by wide straits throughout Tertiary time. But the original pouched mammals which settled in Australia were only members of a group which at that time was spread over the whole world, and has left as its descendants the opossums of America.

South America is a continent whose early history resembles that of Australia. It also was a great land mass, separated by a wide strait from North America, on which several groups of unfamiliar mammals, living in isolation from those of the more vigorous North, evolved into bizarre creatures now represented only by the sloths, anteaters and armadillos. But while Australia has retained its isolation

until to-day, South and North America became connected by the isthmus of Panamá, across which northern mammals—tapirs, cats, dogs, deer and horses—passed south, and the now extinct giant ground-sloths and the armadillos trekked north to the United States.

These two continents have thus been independent centres of evolution, but only of those mammals which have little importance to Man. It is in the great northern land masses that we must look for the ancestors of the domesticated animals and of Man himself.

Through the investigations of the past century we have become very well acquainted with the history of the animals that have inhabited

Parallels to Man's western Europe and the
own story western half of the United
States of America. Much

more recently we have extended our knowledge of India and discovered the importance of Africa. Lastly, since 1920, we have learnt the history of Mongolia with remarkable completeness. The history of the mammals which are of special importance to Man is thus well known, and an account of them will not only serve to illustrate by parallels Man's own story as it is told in the following chapter, but will also set the stage on to which he came.

The time during which Tertiary rocks were being laid down was an immensely long one: some millions of years separate us from its beginning. It is therefore necessary to split it up into periods following each other in succession, which give us a time scale, not in years, but exactly analogous to the division of Egyptian or Chinese history into dynasties.

The first of these periods is the Eocene, a name that means Dawn of Recent (Life). This is succeeded in turn by the Oligocene, Miocene, Pliocene, Pleistocene and Recent periods, only the last two of which yield undoubted remains of Man, although, as Sir Arthur Keith shows in the next chapter, some of his ancestors—men at least by courtesy—lived in Pliocene times.

In early Eocene times the great North Asiatic centre of evolution was connected with Europe and with North America by

land, across which mammals wandered so freely that we find the same creatures all over this vast northern continent. Amongst these were our own ancestors, and those of all the Old World monkeys and anthropoid apes, in the form of little Tarsioids, very small, monkey-like creatures with large eyes looking directly forward, with big brains and a small face. They and all their relatives were tree-living, eating leaves and fruits and probably also such insects as they could catch.

Gallop[ing] over the plains on which these trees grew was the oldest known ancestor of the horse, called Eohippus, no larger than a fox terrier and very like one in proportions. These little animals differed so greatly from modern horses that no one suspected their relationship until a series of intermediate forms providing a perfect transition from one to the other had been discovered. With them were numbers of little creatures that included the ancestors of the even-toed animals, the pigs, sheep, oxen and deer. At this stage of their evolution it is impossible to sort them out and say that these are pig ancestors and those the forerunners of the deer.

Preying on them were carnivorous animals, amongst which we find the ancestors of the dogs and mongooses, though none which we can associate with the cats. The giants of this time, however, were archaic beasts like Dinoceras, or Uintatherium (see page 134), which soon died out leaving no descendants.

Towards the middle of Eocene times the land lying to the east of the Ural mountains sank and became a strait connecting the Arctic sea with the great Mediter-
Mammals with no
ran[ean], which in those living descendants
days stretched eastward
to cover the region now occupied by the Himalayas. As a result, Europe became disconnected from the joint continent of North Asia and America, and on it many animals evolved, few of which, however, have any descendants still living. Thus isolated, the horse ancestors, for example, branched out into strange creatures, the Palaeotheres, with little trunks like tapirs, and did not go on, as their eastern relatives did, to become fitted to eat grass and to gallop over wide plains. Almost

the only animals of modern interest which originated in Europe at this time are the pigs and antelopes.

In Asia the horses pursued a gradual but steady evolution, side by side with deer ancestors, whilst in North America the camels pursued a parallel course of increase in size. The oldest Tertiary mammals which we know from Africa belong to this period and give evidence that the continent was and had long been almost completely isolated.

By Oligocene times dogs and cats are recognizable in both Europe and North America, but most of them belonged to groups, such as the sabre-toothed cats, which are no longer living. Towards

		Characteristic Type	Fore Foot	Hind Foot		Teeth	
QUATERNARY OR AGE OF MAN	Recent				One Toe (both feet)		
	Pleistocene						
	TERTIARY OR AGE OF MAMMALS	Pliocene				Three Toes (both feet) Side Toes not touching ground	
		Miocene					
		Oligocene					
TERTIARY OR AGE OF MAMMALS	Eocene				Four Toes, Front feet. Three Toes, hind feet. Side Toes touching ground		
Hypothetical Ancestors with five Toes on each Foot and Teeth like those of Monkeys							
AGE OF REPTILES	Cretaceous						
	Jurassic						
	Triassic						



DIMINUTIVE SIZE OF THE DAWN-HORSE

The horse is one of the few mammals whose ancestry can be traced through a series of fossils stretching back to the Eocene. Its earliest form, Dawn-horse or Eohippus, was no bigger than a modern horse's skull and like a fox-terrier.

Courtesy of American Museum of Natural History

HOW THE HORSE EVOLVED

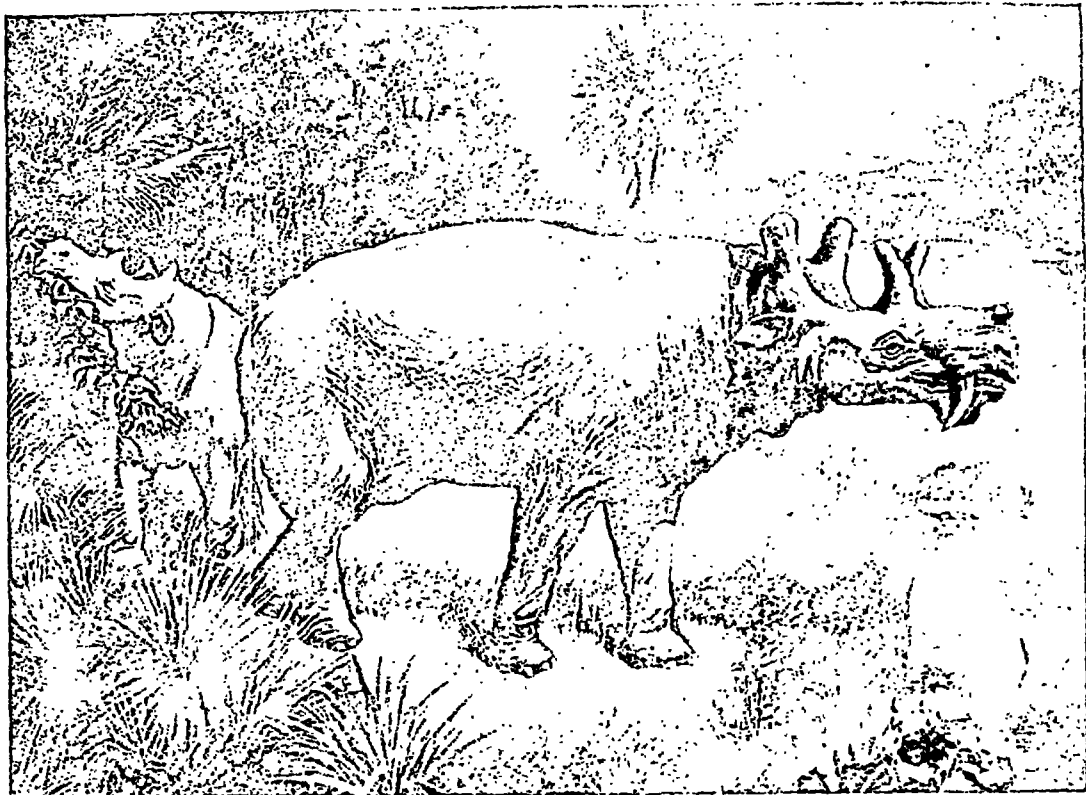
Fossil skulls, toes and teeth show how the horse has changed through millions of years, from tiny three-toed Eohippus (reconstructed below) to the great hoofed creature that serves mankind to-day.

Courtesy of American Museum of Natural History

the end of the same period Africa became connected with peninsular India and elephant ancestors, mastodons, invaded Asia, there to develop into those true elephants that lived alongside early man in England as in so many other parts of the world.

At a later period, the Miocene, Europe became connected directly with Mongolia and with India. It then received a peculiar horse, adapted to browsing and to life in forests, true deer with small, simple antlers, and also the first mastodon accompanied by the first anthropoid apes, closely allied to the ancestors of man as well as to those of the chimpanzee and the gorilla. Meanwhile, a gradual evolution brought into being many diverse forms of antelope, probably in India; it was certainly in India that some of them passed on to become in course of time the first of the oxen.

Miocene times brought to America a few animals from southern Asia; most important were the mastodons which,



BULKY BUT BRAINLESS : AN EXTINCT MAMMALIAN MONSTER

The little mammals of the early Eocene mostly progressed in complexity and brain-power till they became the mammals of to-day ; but one group grew only in bulk without any increase in the size of the brain, and we are not surprised to learn that it is now quite extinct. The *Dinoceras* (' Terrible-horn ') was a member of this group and is found in North America ; though a vegetable feeder, it obviously deserves its name. *Arsinoitherium* (see page 128) is a similar instance.

Reconstruction by C. R. Knight, American Museum of Natural History

being great travellers, ranged onward and finally, when the Isthmus of Panamá was formed in Pliocene times, passed downward into South America.

The end of Miocene time saw the spread of a marvellous mammalian fauna over the wide grassy plains which extended from the extreme west of Europe across south Russia to China. Where these animals originated is not certain ; some were clearly of Indian origin, others came from northern Asia and others from Africa. Together they form one of the most imposing groups of big game that have ever existed. There were several kinds of three-toed horses, five or six different rhinoceroses, some with no horns, the others with two ; there was an extraordinary animal (*Chalicotherium*, much like the better known *Moropus*) with a horse-like head but with immensely long forelegs, short hindlegs and toes, all ending in huge claws, which enabled the

animal to dig up roots for food ; there were giraffes and okapis, and with them closely allied forms, but of giant size and rather different in appearance. Antelopes in great variety grazed over the plains, some with horns like gazelles, others with long, greatly curved horns like the sable antelope of Africa, and others with spirally twisted horns. There were pigs, including a giant form with a skull nearly two feet in length. Walking amongst them were several different sorts of mastodons, elephants with four tusks, two in the upper and two in the lower jaw.

Preying on these herbivorous creatures were wolves of many sorts ; hyaenas and some less heavily built but similar forms ; sabre-toothed cats ; and a bear of a curious type. In the trees and rocks lived a small monkey, perhaps the ancestor of the baboons.

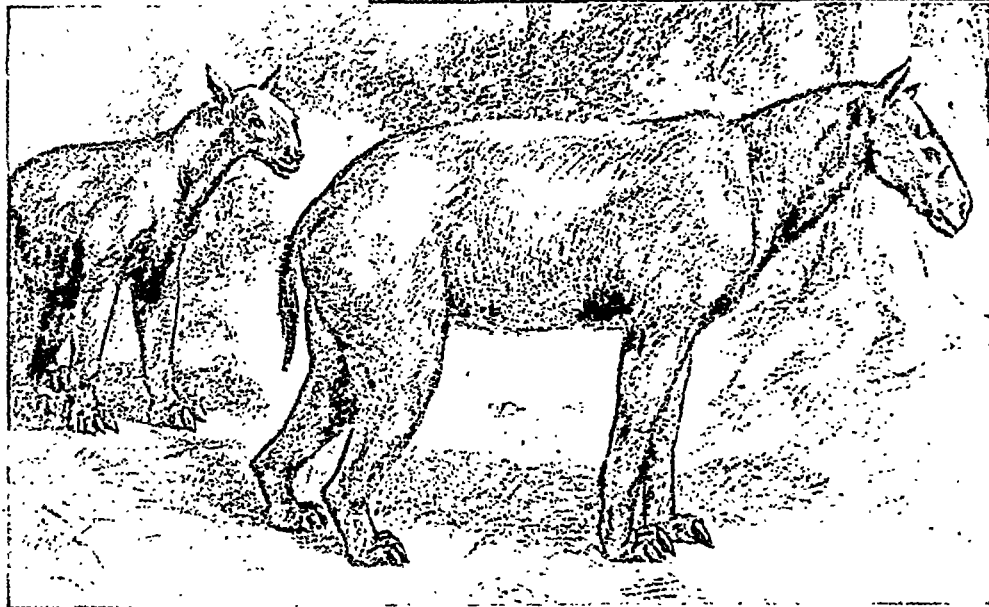
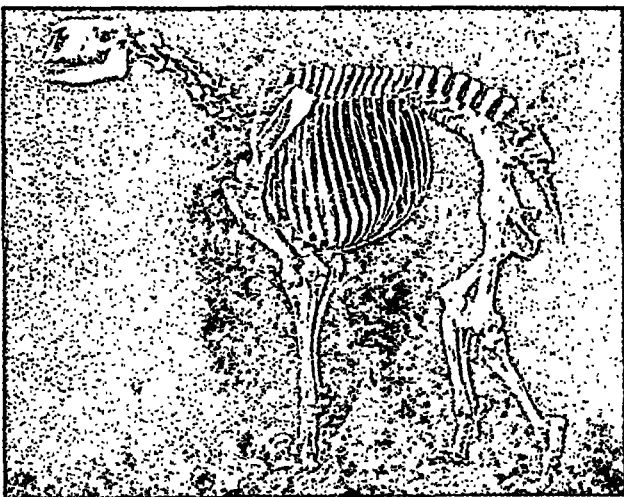
This great fauna is found with minor modifications from Spain to China ; to

the north of it, in the forested region of Germany, there lived a somewhat different set of mammals, among which were tapirs and a huge elephant-like creature, *Dinotherium*, with down-turned tusks in its lower jaw only, while the antelopes were replaced by deer. To the south, in India, was a variant set, including one-horned rhinoceroses and great herds of hippopotami.

After a short period this great fauna vanished from Europe and North Asia, passing down to colonise Africa, and in its place there came in a new group of animals. Of these the most interesting are the true one-toed horses, the true elephants, the hippopotami and the oxen, but with them were numerous deer—some the ancestors of the fallow deer, others their near but giant relations, and others, again, of types now extinct. This Upper Pliocene fauna is found in what is known as the forest bed on the Norfolk coast

and lived here when the climate was a little warmer than it is now.

From those times to the present day the English climate has undergone a series of changes; periodically it became so cold that the mountains of Wales, the Lake District and Scotland gave rise to glaciers big enough to flow together and form a thick ice sheet covering not only the hills where it arose but the lower-



NOT YET EXTINCT? ONE BEAST WITH THE TRAITS OF THREE

Strangest of the late Miocene fauna were great claw-footed beasts, seemingly compounded of horse and ground-sloth. This example is an American species, *Moropus* ('Sloth-foot'); but an African sort had much longer forelegs than hindlegs, thus apparently adding a touch of hyaena to the mixture. It is by some believed that *Chalicotherium*, the African variety, is not yet extinct.

Photo, courtesy of American Museum of Natural History; reconstruction by Prof. W. B. Scott

lying land of Lancashire, Cheshire and Shropshire, filling much of the Irish Sea and meeting the Irish glaciers. To the east, the ice avoided the Pennines and the moors of Cleveland, but streamed out over Northumberland until it met the much greater river of ice coming from Norway and was forced southward to impinge on the East Anglian coast.

But this great ice sheet, like that of Greenland to-day, was not permanent; several times it crept forward and then withdrew, because its end

Setting of Man's early Life melted faster than it was replaced, so that we have an alternation of glacial

and interglacial times, cold and warm respectively. It was under these conditions that the first human inhabitants of Britain of whom we have knowledge hunted animals for food and for the materials of their clothing and tools.

The first onset of the cold climate is marked by the incoming of the mammoth, a large elephant with very big, spirally-coiled tusks. This animal is known to us not only by complete skeletons, but also by the magnificent sketches and statuettes made on the walls of caves and on mammoth ivory by the Palaeolithic hunters (see Chap. 6). These drawings show the animal covered with long fur hanging down below the body. Fortunately we are able to confirm this unusual condition from the actual skin and hair of mammoths preserved in the frozen soils of North Siberia (see page 191). They were covered with a thick coat of reddish hair, through which projected much longer and thicker black hair.

The mammoth was always accompanied by the woolly rhinoceros, an animal closely allied to the white rhinoceros of Africa and, like it, provided with two horns, the first of which was much longer than the hinder one. With these two animals are found the remains of bison and of a gigantic ox, the aurochs, with long, forwardly-directed horns. Red deer and the extinct Irish deer lived in the forests, horses on the open country. There were many bears, also hyaenas and lions.

With the return of warmer conditions the mammoth and woolly rhinoceros left the country, no doubt travelling to the

north after the retreating glaciers; their place was taken by the straight-tusked elephant, of which a skeleton was found at Chatham, Kent, during the Great War. These bones are now in the Natural History Museum in London, and have been put together, so that it is possible to determine the height of the animal by direct measurement; it proves to have been fourteen feet high, perhaps the tallest elephant ever measured. The animal is characterised by its long, straight tusks and swollen forehead. With it are found the bones of a two-horned rhinoceros, differing from that which departed with the mammoth, and these two were accompanied by the hippopotamus. It was during this warm period that river-drift man lived in western Europe.

A return of glacial conditions brought about a southerly migration of the straight-tusked elephant and its companions and the re-colonisation of England by the cold-loving mammoth. The next and last cold period, which may have ended only some 10-12,000 years ago, brought great hordes of horses and of reindeer.

Since this time the climate has, with many fluctuations, become milder, and the once splendid fauna has become thinned by the destruction of one

animal after another, either for use as food or because it was dangerous

Animals wiped out by Man

to Man or to domestic animals. The first to go were the mammoth, rhinoceros, cave-bear and hyaena, leaving brown bears and wolves, reindeer, Irish deer and elk, bison and the great wild ox, besides the semi-domesticated animals.

Of this list the next to go was the great Irish deer, which survived long enough to be hunted by Neolithic man, and then died out. The elk and reindeer soon left the south, but survived for a long time in the north of Scotland. Bones of both are to be found in the rubbish of the Brocks, the defensive castles built in Scotland in the fifth or sixth century A.D. The reindeer was sufficiently common in Orkney to have been hunted by the Vikings as late as the fourteenth century. Indeed, in the Orkneyinga Saga it is said that the earls crossed over to Caithness from Norway to hunt red deer and reindeer.

It is not known when bears became extinct, but one of many such traditions says that the last wolf was killed at Lothbeg in Sutherland in 1723. Thus gradually the fauna of Great Britain has been reduced to its present poverty.

In this general sketch of the evolution and migrations of the vertebrates it has been impossible to follow out the history of any one animal in detail. But an understanding of the mode of origin of Man is made much easier by comparison with the better known history of some other animal. Although that of many mammals is very completely known, we will take as an example the evolution of the elephant, which is especially interesting because that animal is so unlike all others.

The first elephant ancestor, called *Moeritherium*, is found in the Upper Eocene of the Fayum in Egypt. It was an animal about three feet high with comparatively slender legs, much more bent at the elbow and knee than those of the true elephants. Its neck and head were long and its eyes were very far forward. There was no trunk, but the end of the snout was flexible, perhaps used like that of a pig for rooting in the ground.

The teeth show that it was pig-like in habits. The cheek teeth have small square or triangular crowns, very low and covered with little hum-

Pig-like ancestor of the Elephants mocks joined together so as to make two transverse ridges. The front teeth are peculiar, the eye teeth being very small, while one pair of both upper and lower front teeth (incisors) are thickened and enlarged for grubbing up roots and bulbs.

By Oligocene times the descendants of the *Moeritherium* had grown much larger and reached a stage called *Palaeomastodon*, an animal about four or five feet high that had already got tall straight legs like an elephant, but still retained a long neck. In order to enable it to dig in the ground the head had to be lengthened, relatively to the body. This was brought about by an elongation of the lower jaw, which carried the large and now shovel-shaped lower incisors forward, well in front of the upper incisors, that had grown into very short, downwardly directed tusks.

In order that the animal might be able to crop plants, the long upper lip, which now projected in front of the skull and was unsupported by bone, had a hard pad, like that of a cow's upper jaw, on its lower surface, and the end of the nose was becoming more flexible, perhaps as mobile as the little trunk of a tapir. In order to grind up the amount of food that so large an animal required, the cheek teeth had become bigger, by an increase in the number of ridges crossing their crown.

In the Lower and Middle Miocene the animal, now called *Tetrabelodon*, had become much taller. This increase in height made it difficult to reach the ground with the front teeth, a difficulty which in most similar cases was overcome by lengthening the neck. The elephants, however, since they dug with their lower jaw, could not use this method because of mechanical difficulties, and so they were again compelled to lengthen the lower jaw and tusks. This change resulted in a still further lengthening and an increased flexibility of the front part of the face, including the nose and upper lip. The upper tusks grew yet larger but were still down-turned.

By the next stage, which is reached in Lower Pliocene times, the animal had grown still taller, and its neck was even shorter. It had now become impracticable to reach the ground with the lower front teeth—it would have required a jaw some eight feet long—and so the mastodons had to adopt some other method of feeding. Probably even in the preceding stage they had been accustomed to pluck leaves with their flexible muzzles, and now they came to rely entirely on that organ. But the use of the trunk must have been very much hindered by a long lower jaw stretching out below it, and we find in consequence that the chin very rapidly shortened, the tusks getting smaller at the same time.

This retreat of the jaw left the roof of the mouth exposed; the belt of skin running down the under side of an elephant's trunk, and differing a little in its nature from the rest, is really the roof of the mouth, which in early forms was actually opposed by the tongue and the cavity of the lower jaw.

When the chin had retreated in this way the unsupported trunk naturally fell down vertically, and thus gained a new freedom and an increased power of use as a feeding organ. At the same time the cheek teeth became still more complicated by a further increase in the number of ridges which crossed them.

An animal as large as the elephants had now become required a gigantic amount of vegetable food—had, indeed, to spend a very large proportion of its time in feeding. At the same time the length of its life increased. It therefore needed teeth which would rapidly and effectively grind up its food, and at the same time be able to last the animal throughout its life.

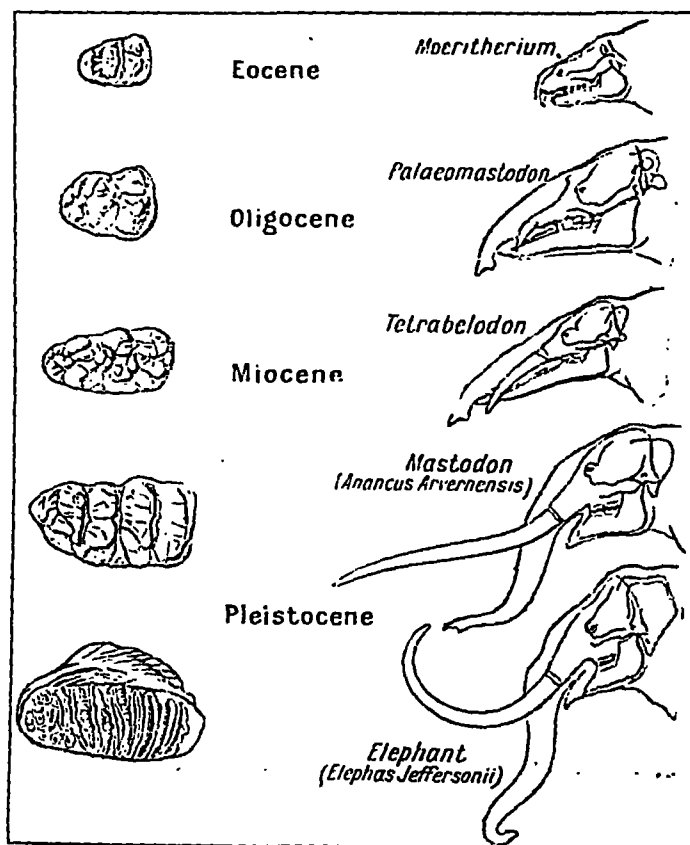
In the living elephant these two needs are met by multiplying the number of ridges across the cheek teeth and so greatly increasing their height that they become

flat plates, which may be some eight inches high. To secure strength these plates are soldered together by a bone-like substance called cement. This arrangement makes each tooth more efficient and more lasting. But in order to add still more to the life of the dentition, and hence to that of the animal, the elephant uses only two cheek teeth in each side of each jaw at the same time. As each tooth is worn out it is replaced by another which grows up from behind. Thus during its lifetime an elephant wears down a little less than a yard of solid tooth. The changes which produced this marvellous set of teeth can all be followed in detail in the elephants from the Pliocene Period in India, but they are too lengthy to be described in detail here.

As soon as the chin had been withdrawn and the trunk had become freely movable, the upper tusks began to bend upwards so that they could be used as crowbars for uprooting trees and, in conjunction with the trunk, for breaking off boughs. Thus gradually the living elephants came into existence, owing their many peculiarities to a constant and successful attempt to cope with the problems presented by their steadily increasing size.

The sketch of the origin and migration of mammals in the preceding pages is intended to illustrate some general principles that must have been applicable to Man's own ancestors and may, in a modified form, be still acting in human affairs. Throughout the whole story we see the uprise of a group of animals followed by its spread over the world so long as it is not hindered by such barriers as oceans or mountain chains.

During its evolution every group splits up into branches which become specially fitted for definite modes of life—land, water and tree forms all arise sooner or later.



FROM MOERITHERIUM TO ELEPHANT

Like the horse, the elephant has a well-attested pedigree. As Moeritherium grew in size, its chin lengthened to enable it to reach the ground, while the fleshy part of the upper jaw kept pace; later the chin shortened again, allowed the trunk to hang down. There were parallel changes in the teeth.

After Lull, Animal Evolution

THE EVOLUTION OF MAN

How Anthropology and Anatomy Combine to Prove
Man's Slow Ascent from Lower Forms of Life

By Sir ARTHUR KEITH M.D. D.Sc. F.R.S.

Hunterian Professor of Anatomy, Royal College of Surgeons; Author of *Ancient Types of Man*, *The Antiquity of Man*, etc.

WHEN we speak of the evolution of Man we really mean his history—the history of how, when, and where he came by the characters of his body, the faculties of his mind, his upright gait and his powers of speech. Clearly, if we are to write of these early events we must carry our search into a period which lies far beyond the limits of written history; we have to tell about things which happened in the world when there was no brain fit to understand them and no hand capable of recording them.

How then is it possible for us to know what happened so long ago, and to write a history of events which took place thousands of years before there was any intelligent hand in the world to record them? It has become possible to supply these long-lost chapters of Man's ascent because we have learned, in recent years, how history can be written in a new way.

Rather more than a century ago a small band of Danish antiquaries, out of pure curiosity, began to dig into the ancient tombs which are scattered over the face of their country, and to collect the objects found in them—weapons, ornaments, vessels and often human remains. They placed all that they found in the Museum of Northern Antiquities, Copenhagen, which is now included in the National Museum of that city; and by about 1830, when their collection had become extensive, the leader of the antiquarian band, C. J. Thomsen, observed that it was possible to divide prehistoric graves into three kinds: there were those which contained no metallic objects—only implements and weapons of stone; in

another kind the weapons and ornaments were of bronze; while in a third group of graves they were of iron.

To explain the varied contents of these three kinds of graves, Thomsen made the happy guess that they represented burials of successive periods of time, those with bronze being older than those with iron, and those in which the weapons were stone being older than those in which objects of bronze were found. He soon proved that this likely supposition was right; it was borne out by other kinds of evidence which came to light. When peat-cutters were at work on the moorlands and when, in other places, deep foundations were being dug for new buildings, or when trenches were cut for the laying of drains, there came to light objects which former inhabitants of Denmark had lost or cast away. In such cases the order in which they came to light was always the same—those of iron lay nearest the surface; deeper still came those of bronze; deepest of all came those of stone.

The Danish antiquarians began to perceive that the Earth itself kept a record of Man's doings; in ancient tombs, in peat bogs, in river banks there were preserved. Earth keeps
hieroglyphs of Man's past Man's record
—the materials out of which history could be written. From such evidence Thomsen concluded that three successive ages must be distinguished in the prehistory of man—a Stone Age, a Bronze Age and then an Iron Age. It was in Denmark, which, in a geological sense, is amongst the youngest of European countries, that Man's early history began to be written in this new way.



HOW RUBBISH HEAPS BECOME REPOSITORIES FOR HISTORY

A record of prehistoric man is provided by the objects accumulated on the floors of his cave-dwellings. We find layers of such refuse deposited one on top of the other, and in them (as seen above) discarded flint implements, the bones of animals that served as food, and ornaments—sometimes human bones. All these help the historian to reconstruct a picture of remote antiquity.

From the British Museum

The archaeologists of France did more than those of any other country to turn this new way of writing history into a science. In large parts of their country, particularly in the region of the Dordogne, there are many natural limestone caves; it was in the floors of these caves that French archaeologists discovered their materials for history. Edouard Lartet and his colleagues began to examine them systematically about 1860, and found that many had been used as human habitations or burial-places throughout long ages during past times.

Fortunately for the historian the cave-dwellers were not cleanly folk; they never swept their floors; the debris of their feasts, their ashes and disused hearths, their discarded tools and their lost

ornaments, were trampled under foot. Dust blew in at the mouth of the cave; chips of rock, or water laden with calcareous salts, dropped from the roof. Thus the floor of the cave gradually rose in height until the cave-dwellers had under-foot ten, fifteen or even thirty feet of various strata, each of which represented a historical record of a long time past. Not infrequently the cave-dwellers also buried their dead in the floor of their abode.

Exploration had not proceeded far when the French archaeologists perceived that the caves of their country carried the history of man far beyond the period of the most ancient of Scandinavian tombs. The Iron, Bronze and Stone ages—such as were recognized by Danish antiquarians—

were confined to the more superficial strata of the French caves; deep under these the antiquarians came across deposits, layer after layer, in which there were stone implements of an altogether different type from those of Denmark. In the same strata occurred the fossil bones of diverse animals which had been long extinct in France—bones of reindeer, of the hyaena and of the cave bear.

An Englishman—Lord Avebury—coined happy names for these two kinds of stone implements: the kind known to the Danes he called *neoliths* (new-stones), and the time in which they were made he

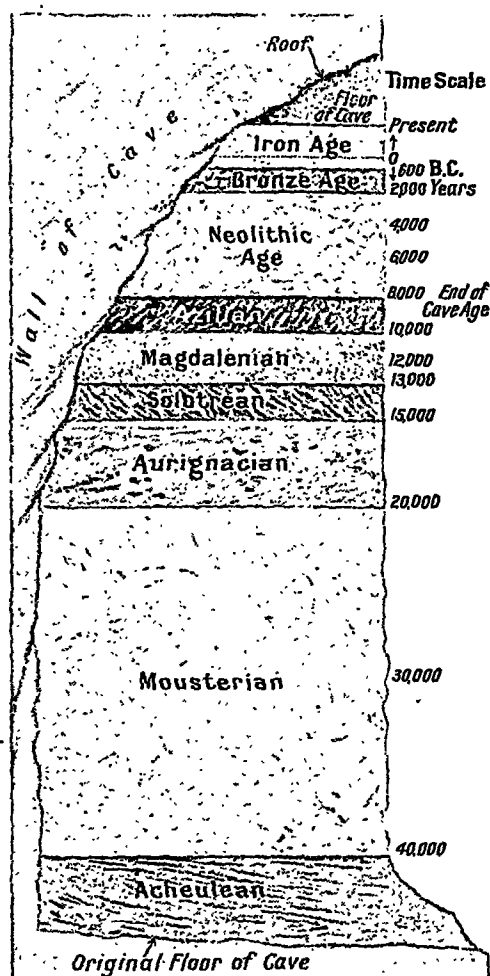
named the Neolithic Period; the stone implements of the caves he named *palaeoliths* (old-stones) and the age of their manufacture the Palaeolithic Period.

Very soon the French archaeologists perceived that the cave period covered a very long space of time, for as they dug they found evidence that there had been changes in the climate, and that it was possible to distinguish one stratum in the cave floor from others by the kind of palaeoliths it contained. They found that there was not one Palaeolithic Age, but a sequence of them, each age being distinguished from that which went before it, and from another which followed, by the style or fashion in which its palaeoliths were worked. Further, on comparing one cave with another, it was found that the sequence of fashions or cultures was always the same; it is true that in very few caves were all the phases of the Palaeolithic Period represented; if a cave were forsaken during a certain phase, then it is clear that the culture of that phase would be unrepresented.

Later, when the archaeologists of Britain, Germany, Italy and Spain came to examine caves they found that they had, in their own countries, the same palaeolithic cultures as in France, and that one culture had followed another in the same sequence.

In this way caves provided materials for a new history of Man; it thus became possible to carry the narrative of Man's past far beyond the oldest records not only of Denmark, but also of Egypt and of Babylon. The excavator's spade, in laying bare the events of prehistoric times, has revealed nothing more wonderful than this—that in ancient just as in modern Europe a fashion of one region gradually spread until it prevailed in all parts of the continent, and that after a shorter or longer reign it was succeeded by another fashion. Our ancestors, like ourselves, were slaves of fashion, but there is this difference between us: their fashions in stone culture were enduring, and changed only after a long period of time, whereas we workers in iron pass quickly from one phase or fashion to another.

Let us glance for a moment at the point which present-day archaeologists have



MAN'S STORY WRITTEN IN THE SOIL

The deposits on the floors of cave-dwellings show the time-sequence of objects discovered. This sectional diagram represents an ideal cave-floor with all possible layers present; the dates (Sir Arthur Keith's) give their relative durations.

reached in the deciphering of cave history. In page 143 there is represented a section of an ideal cave—one in which there is no missing stratum. We may pass over the three upper layers or strata in which are found records of the Iron, the Bronze and the Neolithic ages and come to the uppermost or latest of the true cave strata; to the chapter of history represented by this stratum archaeologists have given the title Azilian, because the stone implements

and ornaments fashioned by the men of the time occur abundantly in a cave near the village of

Mas d'Azil on the upper waters of the Garonne, France. Then come in sequence, as we go farther backwards in time, the chapters headed Magdalenian, so named because the culture of the period was first found in the La Madeleine cave, in the Dordogne; Solutrean, from the famous habitat of ancient man at Solutré, near Mâcon, France; Aurignacian, so named because the culture of the period was first observed in a cave near the village of Aurignac, in the Haute Garonne; and last and oldest of the cave series, the Mousterian, a title given because the peculiar flint implements of the period were first known from the cave at Le Moustier, in the Dordogne.

Concerning the sequence in which these chapters of ancient history have to be arranged archaeologists are in no doubt; as we follow the history of Man backwards in Europe the cultures of these ages or periods always occur in the order just named. But when we are asked, How long is the period of time covered by each of these six chapters? When did the cave period begin? When did it leave off?—we have to fall back on reasoned guesses. The estimates given in page 143 must be regarded as provisional; further discoveries are likely to reduce our estimates of the duration of the later periods and extend those of the earlier ones.

We do know, however, that the cave period came to an end after the close of the last ice age, and Swedish geologists, particularly Baron de Geer, have been able, from the glacial records of their country, to form a reasoned estimate of when glacial conditions finally disappeared from

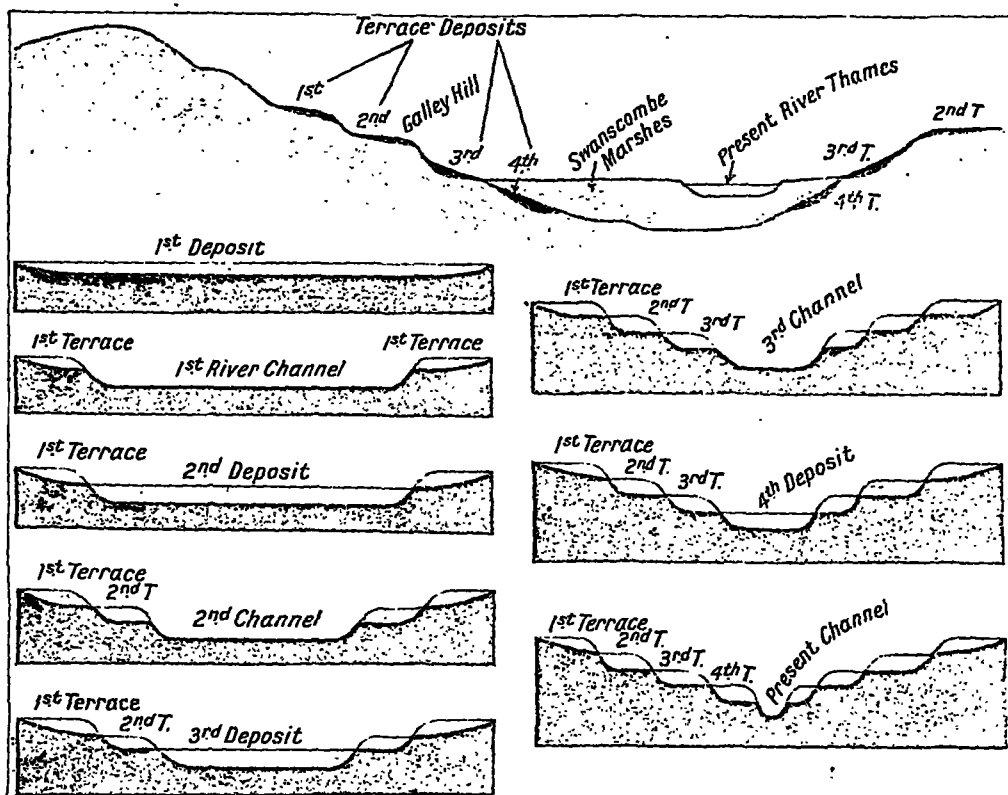
Southern Sweden. They conclude that it was about 12,000 years ago. Thus we may fix the date at which the last chapter of man's cave history came to an end about 10,000 years ago (8000 B.C.). When we consider that the earliest of the true cave periods—the Mousterian—had already commenced before the last ice age had set in, and at a time when Europe enjoyed a climate even more temperate than that of to-day, it will be seen that the 42,000 years, which are supposed to have elapsed since the Mousterian period began, is not likely to prove an over-estimate.

This, the earliest of the true cave periods, we shall see, is to prove the most important of the series, for it contains the bones and the culture of a type of humanity exceedingly different from, and far more primitive than, any race of man now living. This race or species—for it was totally different from any living race—is known as Neanderthal man. Both men and women had curiously shaped skulls, with flattened roofs and great supra-orbital ridges over the eye sockets, but with relatively large brains. They were squat, thick-set people with a waddling gait. They became extinct at the end of the Mousterian age. Thus, by an intelligent use of the spade, the history of cave man has been traced through and beyond the last of the glacial epochs.

By means of cave records we have followed Man's history backwards for a period of 40,000 years or more, and reached a time when Europe was inhabited by a species of mankind quite unlike ourselves, one to which, as mentioned above, the name *Homo neanderthalensis* has been given. The evidence of caves confirms us in the belief that the sole inhabitants of Europe throughout the long period when stone implements were fashioned in the Mousterian manner were men of the Neanderthal type.

Primitive as was this type of man, yet in his body, brain and ways he was altogether human; to find the morning of mankind we must resort to an altogether different kind of history—the kind which is written by stream and river. Never

History from
River Terraces



THE THAMES AS HISTORIAN: PREHISTORY REVEALED IN ITS DEPOSITS

Each of the four terraces seen in this diagram of the Thames valley at Galley Hill was at some time part of the river bed, when alluvial matter accumulated on it. Periods of erosion followed those of deposition, and so the present valley was carved out in steps. Pall Mall, Piccadilly and Holborn are on successive terraces in London; other rivers show the same phenomenon.

a shower of rain falls but some loose object is washed from meadow or ditch into a neighbouring stream; every flood which sweeps over a valley bears away the carcasses of drowned beasts and carries them out to the main channel of the river, where they sink; sooner or later, some fragments of them become incorporated in the mud and gravel of the river's bed.

A river never runs straight; it meanders from one side of its valley to the other, eating into its bank at one place and filling it up at another. Hence the bed of a river, with treasure trove garnered from all parts of the country-side, does not form a long, narrow strip down the middle of a valley, but a wide sheet which underlies the meadows and fields which cover its floor. In this way every running stream writes history along the floors of valleys. One would almost think that nature was proud of Man's doings in past

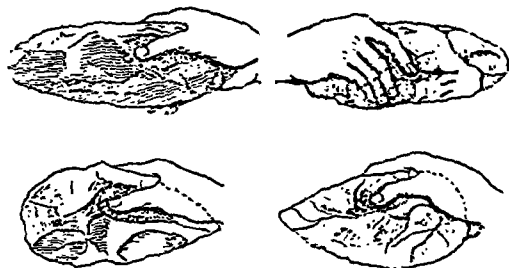
times, and invented streams to keep a record of what he did!

If a land neither rises nor falls, but maintains a constant relation to the level of the sea, then its streams, as they meander along their valleys, plough and re-plough their old beds. But let us suppose the land begins to rise, then its rivers run more swiftly and in time deepen their valleys, parts of the old river beds being left as shelves or terraces along the sides of the deepened valleys. Every river-valley of Europe has terraces along its sides; in the valley of the lower Thames there is a terrace 120 feet above the level of the river, another at about 100 feet, a third at 50 feet and a fourth at 25 feet. These are fragments of former beds of the Thames; in them the river has treasured up documents relating to all phases in the history of her valley.

It is difficult for us, who are so certain of the stability of land and sea that we

spend hundreds of millions of pounds in building ports and in providing harbours, to take such statements seriously; we cannot conceive that a time may come when our ports and harbours will be left high and dry upon the sides of valleys, or that a subsidence may occur which will carry them below the level of the waves. Yet when we obtain opportunities of comparing shore levels at intervals of a thousand years or more, we find evidence of such movements. We see how slow such earth movements are, and how long must be the time which has elapsed since the Thames flowed at the level of the 50-foot terrace, and how much more distant the period when the 100-foot terrace was part of her bed. Clearly 'terrace history' is to carry us into a far more distant past than was attainable by the study of cave records.

There is no episode in the annals of archaeology so romantic as that which centres round the exciseman, Boucher de Perthes. It was he who discovered that valley terraces contained documents relating to the history of early man. In 1825 he was placed in charge of the customs of the town of Abbeville, situated



HOW CHELLEAN HAND-AXES WERE USED

Hand-axes, or 'bouchers,' were believed to have been shaped by nature until Boucher de Perthes perceived Man's handiwork in their forms; this is his own drawing, published in 1864, of how he thought they were used.

in the estuary of the Somme. On the side of the valley, near the town, sand and gravel were being dug from pits situated in the old terraces; workmen, as they used their picks, often flung aside stones which they named 'thunderbolts.'

Boucher de Perthes became interested in them; after studying them he came to the conclusion they could have been shaped only by the hand of Man, and were in reality ancient stone axes or



PIONEER STUDENT OF EARLY MAN

Jacques Boucher de Perthes (1788-1868) was the first to maintain that Man had existed in the Pleistocene period, on the evidence of worked flints found by him in the Somme valley.

From a relief in the British Museum

weapons. The beds of gravel which yielded 'thunderbolts' also contained the fossil bones of extinct animals. This discovery in no wise daunted the exciseman, but it confirmed the opinion of onlookers that his mind was 'touched,' for, said they, 'these fossil animals are pre-diluvian, and does not all the world know that Man was not even created in their time?'

Nevertheless, Boucher de Perthes went on collecting and examining, and although in 1847 he published a great work on his discoveries, all the world remained sceptical until 1858, when certain English geologists came to his aid. They examined his 'thunderbolts' and his fossil bones; they went to the pits and verified his discoveries; they were convinced that the thunderbolts were shaped by Man.

Man, therefore, must have been living in the Somme valley when the 100-foot terrace was being laid down in the bed of a running river, and when strange forms of animals were living in France. In this way was opened the first chapter of Man's terrace-history.

When the English geologists, after visiting Boucher de Perthes, returned to England they soon found in the terraces of the Thames valley the same kinds of thunderbolts, or palaeoliths, and the

same kinds of extinct animals as they had seen in the 'sand-pits' on the Somme. Thus, the art of deciphering Man's history from records made by rivers began nearly one hundred years ago, but it is only in recent years that this art has become a science.

We have already epitomised cave history by giving a diagrammatic section of an ideal cave; we shall sum up terrace-history by combining records chosen from the whole series of valley deposits, giving them the ideal form set out in this page. In the more superficial or later strata of the lower terraces we find the same records as in caves—the same sequence of flint

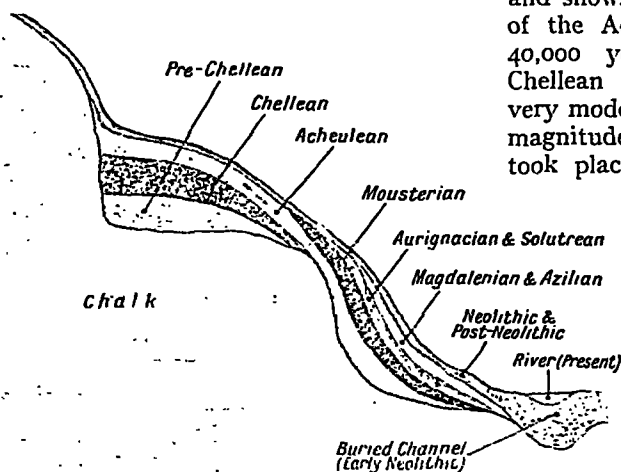
cultural periods put together—from the beginning of the Mousterian to the present—a period to which a provisional estimate assigns 40,000 years. No doubt, as knowledge grows, this long chapter of prehistory will be subdivided into a series of chapters. All through this period a peculiar form of hand-axe sometimes called *coup-de-poing*—the 'thunderbolt' just mentioned—was fashioned and used.

Still deeper in the terraces we come across the older records of the Chellean period, which preceded the Acheulean and occupied an earlier and even warmer part of the same interglacial epoch. The Chellean hand-axe is a larger implement and shows bolder workmanship than that of the Acheulean period. If we assign 40,000 years to the duration of the Chellean fashion in flint implements, a very modest figure, when we consider the magnitude of the land changes which took place during its reign, then we are carried backwards to a point in Man's evolution which lies 120,000 years behind us.

Beyond the Chellean lies a vast, almost uncharted, hinterland of cultures to which, in the present state of our ignorance, we give the name pre-Chellean. The records of this period are found in the deeper strata—the basal strata—of the 100-foot terrace of our river valleys. Pre-Chellean records carry us to the beginning of that period of time to which geologists give the name

of Pleistocene. The period has a deep significance to the student of man's evolution. It was with the dawn of this period that the living animals of the world assumed their present-day features; we may well suppose that Man shared in the evolutionary movement of the time and began to put on those features which characterise his present-day descendants.

With the beginning of the Pleistocene Period the living world began to take on a modern aspect, and hence zoologists place that period as the first of a new series of chapters in the world's history—a series to which they have given the name Quaternary. How long ago this new

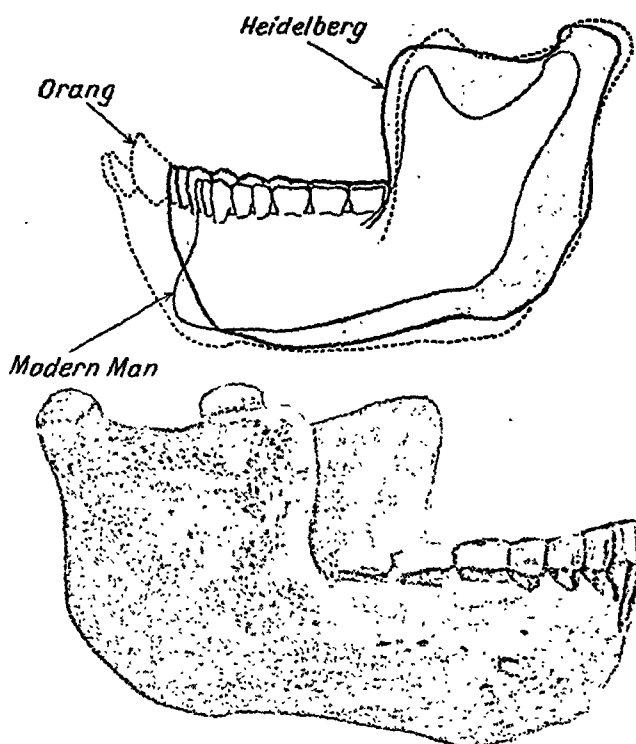


CULTURE-RECORDS KEPT BY RIVER TERRACES

Each of these terrace-strata yields remains of the epoch during which it was laid down, so that we may retrace the history of Man in the Pleistocene Period; here the highest terraces bear the oldest strata. This diagram is by Sir Arthur Keith.

implements, the same kinds of extinct animals and the same forms of human bones. We may thus pass over the more recent records of the terraces—those of the Magdalenian, Solutrean, Aurignacian and Mousterian epochs—merely mentioning that they show the disturbances of ice action and, therefore, save the oldest part of the Mousterian, fall within the last of the glaciations.

We thus come to an interglacial epoch, in which Europe enjoyed a warmer climate than that of to-day. In this long interval falls the period of Acheulean culture, one which we have reason to suppose equalled in its duration all subsequent



MASSIVE JAW OF A PRIMITIVE EUROPEAN

Of the two types of pre-Chellean man discovered in Europe, the Heidelberg and the Piltdown, the former, a primitive type of Neanderthaler, is known only by a lower jaw. As we see above, this is very different both from a human jaw of to-day and from that of an ape. The canine-teeth, however, are actually less ape-like than those of modern man.

series began we cannot yet tell with any degree of accuracy; estimates of a million years and more have been made, but the allowance given in the diagram in page 161—200,000 years—may be regarded as representative of the more moderate, perhaps ultra-moderate, opinion which now prevails. Thus, by means of terrace-history we can follow Man's evolutionary tracks for perhaps 200,000 years.

It was great good fortune, from the historian's point of view, that Man began to use stones as implements and weapons so early in his career. We are enabled to trace him back to the beginning of the Pleistocene by following the track of his discarded stone tools; we have even found the place, or 'floors,' on which he manufactured them. Fossil bones of the men who shaped these tools, however, are but seldom found.

In spite of all the searching and excavation which have been carried out along the river valleys of Europe during these

past fifty years, we have found fossilised bits of but two individual Europeans of pre-Chellean times; one of these was the Heidelberg man—all we know of him is merely his lower jaw. It was found almost at the bottom of a great valley terrace laid down by a tributary of the ancient Rhine; over the stratum in which the jaw lay there were superimposed 78 feet of other stratified deposits.

The stratum which yielded this jaw also contained the fossil bones of the kind of animals which prevailed in Europe at an early point of the Pleistocene Period; clearly Heidelberg man was their contemporary. From a lower jaw much can be told concerning the individual of which it formed a part. In this case the mandible is human, but it is crude, massive and strong beyond anything known amongst present-day races. The teeth, although large, form an even series; the canine or eye tooth, which projects as a dangerous weapon in the mouths of anthropoid apes, has in Heidelberg man fallen into rank with its neighbour.

The teeth, in certain of their features, and the bone-work of the jaw itself, although very different from the teeth and jaws of the most primitive of modern races, are of a kind which foreshadow the teeth and jaw of Neanderthal man—that curious type which occupied Europe throughout the early cave period.

Of the other type of man who lived in Europe in pre-Chellean times we know much more. His fossil remains were found in the oldest part of a terrace laid down by the Sussex Ouse early in the Pleistocene Period. All lines of evidence lead us to the belief that this Sussex deposit, near Piltdown Common, eight miles to the north of Lewes, is older than that in which the Heidelberg jaw was found; if it had been discovered in the valley of the Thames, the Piltdown deposit of gravel would have been

The finding of
Piltdown 'Man'

assigned to the deeper or pre-Chellean series of the 100-foot terrace.

The manner in which the Piltdown deposit was discovered, and the circumstances which brought the fossil bones of this most ancient inhabitant to light, form a tale of the highest interest. The discovery was the result of an intelligent anticipation on the part of Charles Dawson, who practised as a lawyer in Lewes and devoted his spare hours to a study of the geology of this part of Sussex.

In 1908, eight years before his lamented death at the age of fifty-two, he found a country road being mended by a kind of flint which was new to him—a kind which he knew had been used by early man as material for tool-making. He enquired where the road metal had come from, and was directed to a shallow pit on a farm on the verge of Piltdown Common. He visited the pit from time to time, maintained friendly relations with its workmen and after a few years obtained a small, thick plate of bone which he suspected had formed part of a primitive human skull. It was not until 1911 that he recovered a much larger piece of the same skull, and saved it from being used as road metal—for the bone was almost metallic in consistency, and would have served such a purpose excellently.

He then, in company with Sir Arthur Smith Woodward, began to dig in the pit, and they were presently rewarded by the discovery of further fragments of this remarkable individual. They also found fossil bones of extinct kinds of animals and flint implements of two classes—those of a pre-Chellean type and others still older, which are usually named 'eoliths.' The manner in which Dawson and Sir Arthur Smith Woodward set to work will give the reader some insight into the methods followed by those who are building up the history of Man's past. It is not enough

to find fossil fragments; they become historical documents only when a date can be assigned to them.

Enough of the skull was found to give a true index of its original size and shape; from its interior it was possible to take a plaster cast which revealed the size and characters of the brain which guided this early inhabitant of England through the perplexities of life. In point of size the Piltdown brain rises above the average given to the lower races of living man; nevertheless, in certain of its features, it is simple and primitive, more so than is the case of any modern man. Yet in their cranial characters the Piltdown race made a remarkable approach to modern man, more so than in the case of Neanderthal man—whose cranial features were distinctly more ape-like. On the other hand the Piltdown race was decidedly more ape-like in conformation of face.

One half of the lower jaw was found; it is a curious blend, so far as its teeth and framework are concerned, of man and ape. The canine or eye tooth, reduced

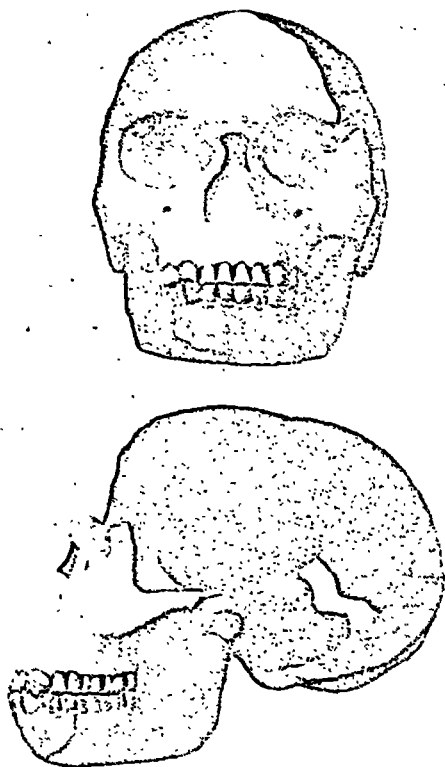
Brain of the
Piltdown race



WHERE THE PILTDOWN SKULL WAS FOUND

In this gravel-pit on Piltdown Common in Sussex were discovered the fragments of the Piltdown skull—that of a woman of a very primitive type of humanity to which the generic name 'Dawn Man' was given. Here we see Sir Arthur Smith Woodward (left) with the French savant, the Abbé Breuil.

Courtesy of Mr. M. C. Burkitt



SKULL OF THE DAWN WOMAN

Prepared by Sir Arthur Smith Woodward, this reconstruction of the Piltdown skull enables us to visualise its facial appearance. The dark portions of the restored skull are the pieces of fossil bone on which the restoration is based.

From British Museum, Natural History

though it was, had the pointed form seen in young anthropoid apes; in the region of the chin the lower jaw was moulded exactly as in chimpanzees, whereas in this region the Heidelberg jaw, massive although it is, yet possessed features which are essentially human. Thus at Piltdown was found a stage in the history or evolution of Man in which the brain had almost reached the modern human level, and yet the face in its size and shape remained a blend of man and ape.

If Man has evolved from a lower ape-like form, and all the evidence at our disposal supports such an inference, then we need not be surprised if, in searching Man's geological past, we encounter a stage in which certain simian traits are still preserved. The discovery at Piltdown revealed to us that, near the beginning of the Pleistocene Period, there was still alive in

England a human race which, although it had reached Man's estate in size and brain, yet retained much of the ape in jaw and face.

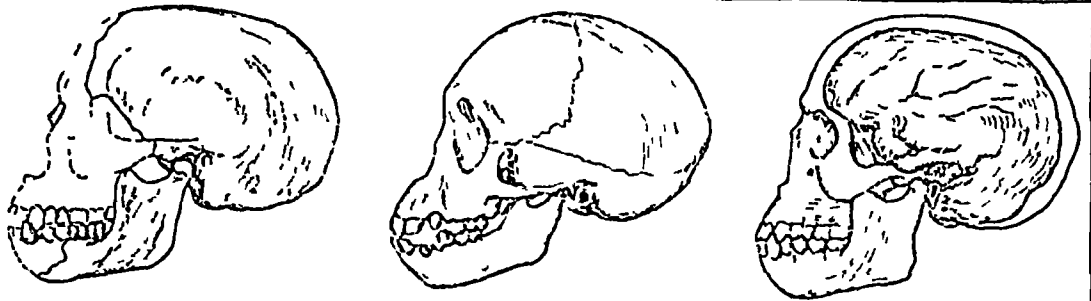
Some authorities, fixing their gaze on the ape-like features of the Piltdown jaw and overlooking all its human affinities, have put forward the suggestion that in ancient Sussex there may have lived a low type of man and a high kind of chimpanzee and that by an odd coincidence the skull of the one and the jaw of the other became embedded in the same patch of gravel. The more reasonable interpretation is, seeing that skull and jaw are in a proportionate scale and in an exactly similar state of fossilisation, to suppose that both are parts of the same individual and that this individual represents a stage in evolving humanity.

So impressed was Sir Arthur Smith Woodward with the ape-like features of Piltdown man that he did not include him in the genus *Homo*, but assigned him to a genus of humanity which had become extinct—a genus of which we knew nothing until the Piltdown discovery was made. To this newly discovered extinct genus he gave the name *Eoanthropus*—which, being interpreted, signifies Dawn Man.

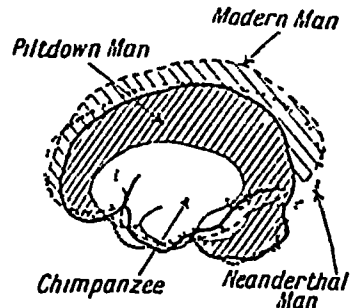
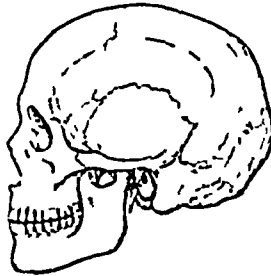
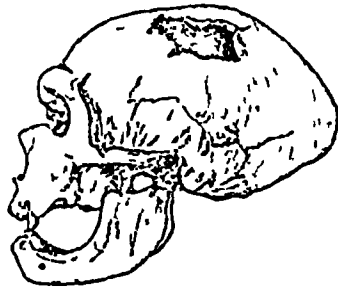
That Piltdown man acted and reacted in a human way we may infer not only from the size and characters of his brain-cast, but also from certain other facts we know concerning him. We know some of the stone implements which were fashioned in his time; they show intention and skill. In the spoil-heap near the gravel-heap at Piltdown Mr. Dawson found a fossilised slab of bone which had been shaped by the hand of man to serve some purpose; in size and shape it somewhat resembled a cricket bat. The condition of fossilisation was in all respects similar to that of the bones found in the deepest layer of the Piltdown deposit.

A full inquiry showed that it had been cut from the thigh bone of an elephant of very large size—larger than the mammoth; a species of elephant which became extinct in England very soon after the Pleistocene Period began may have provided the material for this implement. Piltdown

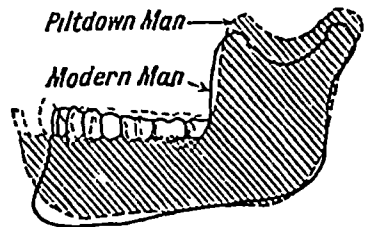
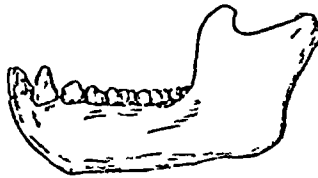
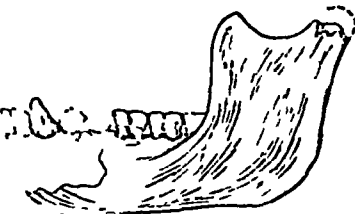
Primitive skill
in tool-making



The Piltdown skull (left) resembles that of a young chimpanzee (middle) in the conformation of the face. This does not mean, however, that Piltdown man was mentally an ape. He had a brain contained in a thick brain case (right—restored by Dr. McGregor), that was definitely human.



The cranium of the Piltdown skull approximates more nearly to a modern human cranium (middle) than does that of the Neanderthal skull (left). In the diagram on the right, the Piltdown brain is contrasted with those of a chimpanzee, a Neanderthal, and a civilized man of to-day.



The most ape-like feature of the Piltdown skull is the jaw (left). It closely resembles that of a chimpanzee (middle) both in the shape of the chin and the arrangement of the teeth. In the third figure, a modern human jaw is superimposed on the Piltdown jaw—note the chin of modern man.

FEATURES THAT CONNECT PILTDOWN MAN WITH APES AND HUMANS

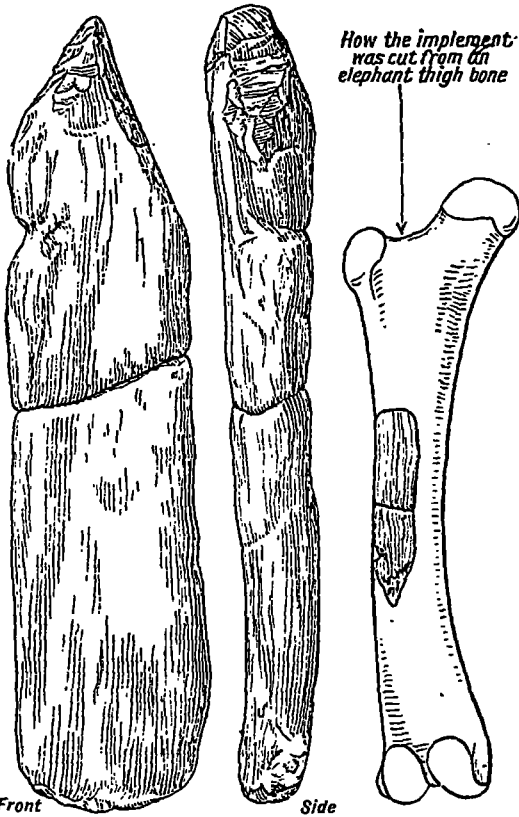
Drawings of Piltdown skull and jaw after Sir I. Smith Woolward, Guide to the Fossil Remains of Man

man had the intelligence to conceive of such an implement and the skill of hand to shape it from such a mass of obdurate material as is the thigh bone of a great elephant. Nay, we do not go beyond the bounds of legitimate inference when we draw the conclusion that man was already, early in the Pleistocene Period, a daring hunter and knew how to capture great game.

There is still another consideration which throws some light on the mentality of the men who lived in Europe while the older records of the valley-terraces were being stored up. We have seen how cave man was the slave of fashion—how certain methods of shaping stone tools spread over

almost the whole continent of Europe and were slavishly followed during long periods of time.

When we pass to the older records of the valleys we meet with evidence of the same kind of mentality. Where the stone cultures of the Acheulean, Chellean and pre-Chellean originated we cannot yet tell, but clearly the men of these periods—'drift' men they are sometimes named in contradistinction to 'cave' men—were swayed by that same impulse or tendency which makes the woman of to-day the slave of fashion. Our modern means of communication render it possible for a fashion to spread through the civilized world in a few weeks, although it may



IMPLEMENT OF ANCIENT HUNTERS

This unwieldy instrument was found near the Piltdown fragments, and is similarly fossilised. About sixteen inches long, it was cut, probably by Piltdown man, from the thigh bone of a gigantic elephant, long since extinct.

After Sir A. Smith Woodward

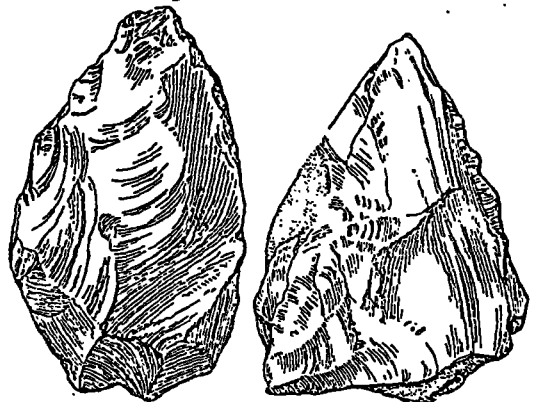
endure but for a few months. In the world of 'drift' man the spread of a stone culture was a slow matter, one which we may suppose took many centuries, but once established its duration had to be reckoned in tens of thousands of years.

By means of records preserved in ancient tombs, from materials stored for us in the floors of caves and from documents drawn from terrace-deposits of river valleys we have been able to trace Man's history, by means of scattered fragments, backward over a period of some two hundred thousand years. We have thus reached the beginning of that chapter of the world's history to which geologists have given the name Pleistocene. The evidence obtained at Piltdown is sufficient to assure us that shortly after the dawn of the Pleistocene Period, Man was already becoming definitely human in shape, thought and action.

We have now to set out on a new journey, one which will carry us into the geological period which preceded the Pleistocene—that to which geologists have given the name Pliocene. For this purpose we have to leave the records that are preserved for us in river valleys and seek for older repositories.

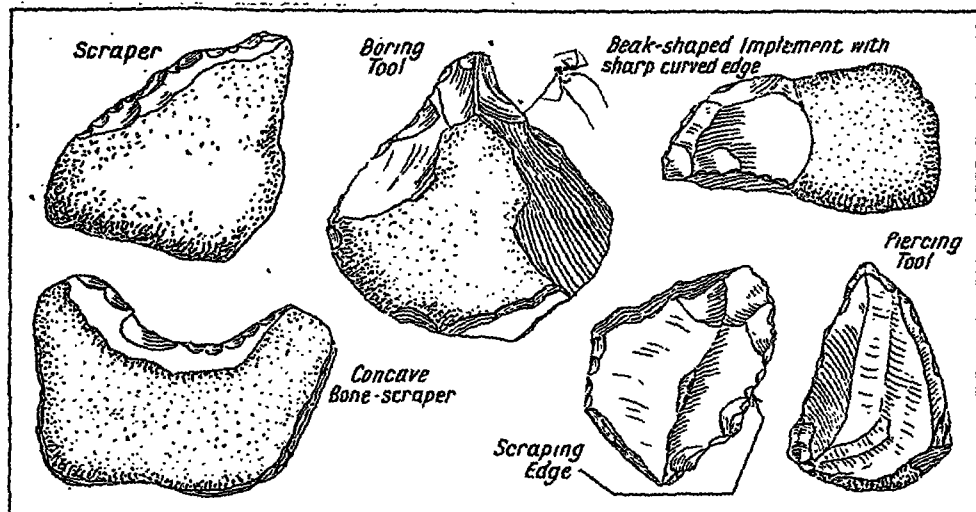
In the Pliocene Period, just as to-day, the Thames was depositing in its estuary and in adjacent parts of the North Sea tons of material gathered from the south-eastern parts of England. In its muddy load, particularly in times of flood, were borne samples and fragments of all kinds of things which lived and grew within its watershed. Out in the estuary and along adjacent shores the river became relieved of its load, which sank to the bottom to form geological records. All the eastern streams of England were writing history in this way during the Pliocene Period. So, too, were the Rhine, the Elbe and other great rivers which drain central Europe and flow into the North Sea.

In Pliocene times the rivers of north-western Europe converted the basin of the North Sea into a great geological museum for the preservation of contemporary records. In the course of time the basin of the North Sea became so filled that the estuaries of the Thames and Rhine were not where they are now, but lay to the north of the Wash and Dogger Bank, England being widely joined to the opposite parts of the continent by an extensive plain. Most of this Pliocene



FLINTS RUDELY SHAPED BY EARLY MAN

Piltdown man could probably manufacture articles from flint as well as from bone, since near the skull were found apparently contemporaneous flint implements, coarsely flaked and very unshapely, like those shown above.



TYPES OF FLINT TOOLS USED BY THE PRIMEVAL INHABITANTS OF SUFFOLK

Eoliths—roughly shaped flint implements—have been discovered in Pliocene formations in East Anglia, and show that even in this remote period Man was possessed of considerable intelligence. The six seen above, discovered by J. Reid Moir, are of two types. The three on the right are more artistically and dexterously fashioned than those on the left: they are probably more recent.

By permission of Mr. J. Reid Moir

plain has now gone; since it was formed the North Sea basin has undergone subsidence and elevation several times, and most of it has been scoured away by river and by tide; but a fringe of the Pliocene plain still remains along the coast lands of East Anglia.

It will thus be seen that when we set out to seek for traces of Pliocene man we still depend, as in our search for Pleistocene man, upon records stored up for us by running streams. All rivers write history; the geologist deciphers their hieroglyphs for us.

If human beings lived in England during the deposition of the North Sea plain and adjacent estuarine lands, then the Pliocene formations of East Anglia are the most likely of all to yield traces of their existence. More than twenty years ago J. Reid Moir, whose home is in Ipswich, began a systematic search of the Pliocene deposits of East Anglia; such deposits are opened and quarried by manufacturers of cement and makers of brick, and fossiliferous beds and old land surfaces are often laid bare. Very soon Moir began to observe that at such levels there were to be found flints which showed definite evidence of human workmanship.

A search of many years placed him in possession of a collection of such imple-

ments. In shape and in mode of chipping they differed from the types which are met with in pre-Chellean and Chellean deposits. He also searched for traces of man along the foreshores of Suffolk and Norfolk, because with every storm the waves beat against soft crumbling Pliocene cliffs and spread out their more solid contents on the adjacent beach. Amongst the outwashings of the foreshore he has, from time to time, had the fortune to find shaped flints which in the opinion of many experts are to be unhesitatingly accepted as showing definite evidence of human workmanship. But of the fossil remains of the beings who shaped these stones not a trace has yet been found. Some day, if the present watch and search are maintained, we need not doubt that they too will come to light. Nor has a fossil human bone been found anywhere in the Pliocene deposits of Europe.

First traces of
Primeval Man

Before we proceed further in our search for Pliocene representatives of humanity, we must first form an estimate of the duration of this period. Geologists have calculated that, if the deposits and strata laid down during the Pleistocene Period could be superimposed, their total thickness would amount to about 4,000 feet;

a similar calculation for the Pliocene Period gives rather a higher figure: 5,000 feet. If we accept the thickness of deposit as a rough measure of geological time and allow 200,000 years for the formation of Pleistocene strata, then we must, on the same scale, allow 250,000 years as the time needed for the accumulation of Pliocene strata.

When we consider the evolutionary modifications which took place in the fauna of the world during this geological period and the geographical and climatic upheavals which

Back to the Pliocene Period marked its course, such an estimate must appear to fall far short of the truth. The wise geologist, however, although he has an unlimited credit at the bank of time, behaves always as a prudent man of business and draws his cheques for the least possible amount.

Thus the Pliocene Period into which we are tracing Man's history endured for about a quarter of a million years, and the deepest and oldest level from which Reid Moir obtained primitive stone implements lies about two-fifths of the way down. If we accept the evidence as it stands to-day, and much of it is highly speculative, then we have to assume that soon after mid-Pliocene times—some 300,000 years ago—there existed in that part of the world which has become western Europe human beings with sufficient intelligence to invent tools and sufficient skill to use them.

Nor are the implements discovered by Reid Moir in East Anglia the oldest records of Pliocene man which have been found in England. Up in the high plateau of the North Downs of Kent there are now no streams, but at one time there must have flowed powerful rivers, for we still find patches and beds of gravel which indicate their former existence. In these deposits of Pliocene gravels Benjamin Harrison began to search for implements in 1864, and found certain flints which he believed had been deliberately chipped by human beings in Pliocene times in order to serve a definite purpose.

Harrison's implements became known as 'eoliths,' and for many years their human origin was regarded with the

utmost scepticism. As archaeologists became more expert in distinguishing between flints which had been accidentally and those which had been intentionally chipped this scepticism became less and less, and when Harrison died in 1921, aged 83, he had won over to his way of thinking the majority of his critics. If it be true that Man in the course of his evolution became a tool user only when his brain reached a certain stage of development, then eoliths may well represent the workmanship of his apprentice hand. Reid Moir regards the Kentish eoliths as ruder and earlier tools than those which he has collected in East Anglia. In the Pliocene deposits of Belgium Rutot, the veteran Conservator of the Royal Museum of Brussels, has found many examples of what he regards as Man's early attempts to shape flints into tools and weapons.

Up to this point we have focussed our attention on the geological deposits formed in the basin of the North Sea during the Pliocene Period. Similar processes were then at work in all the lands and seas of the world; we find Pliocene deposits along the shores and hinterlands of the Mediterranean; they occur away in the high plateaux of central Asia. It is very probable, as Dr. Henry Fairfield Osborn expects, that these central Asiatic deposits of the Pliocene Period will yet yield to us the missing and critical stages of Man's evolution.

Up to the present there have been found the remains of only one specimen of Pliocene humanity, and these were discovered in strata laid down by a river in the eastern part of the volcanic island of Java during Pliocene days. The strata of that period are now exposed as a cliff fifty feet in height, standing on the eastern bank of the Bengawan, a stream which, rising in the central part of Java, takes a north-easterly course to the sea. Here in 1891 came a young surgeon of the Dutch colonial army named Dr. Eugène Dubois. As a medical student in Holland he had speculated on the possibility of Man's evolutionary stages being found in Java, and entered the colonial service to test his theories on the touchstone of fact.

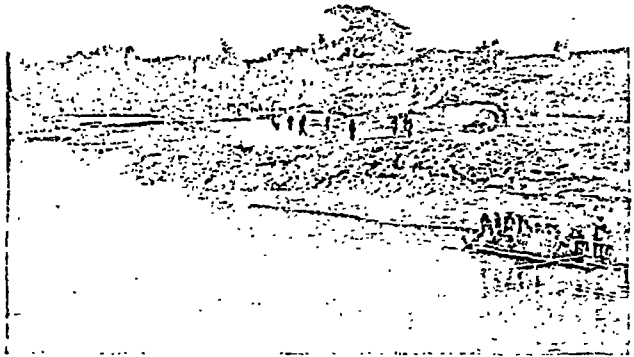
Discovering
Java's Ape Man

Near the foot of the cliff on the eastern bank of the Bengawan is a stratum particularly rich in fossil bones; as the stream eats into this stratum the fossiliferous contents become strewn along its bed. Fossil bones of many kinds of extinct mammals belonging to species and genera similar to those which lived in India during Pliocene times were known to be particularly abundant. No wonder the young surgeon's attention was soon drawn to this corner of Java; its fossiliferous stratum provided ideal opportunities for his search.

He set his workmen to quarry the fossil-bearing stratum, and after digging for three seasons found fossil fragments of a strange kind of being to which he gave the name of *Pithecanthropus*—or Ape Man—because he believed that he had found what all the world had long talked of, but which no man had seen—the veritable transitional form or 'missing link' which marked the passage from ape to man.

We have to admit that the deposits from which this curious being was recovered were laid down in later Pliocene times; it is possible that *Pithecanthropus* and his mates—his parents, cousins and children—were alive in Java when the Pliocene deposits of East Anglia were approaching completion. On our scale of reckoning that would be between 200,000 and 300,000 years ago. Having thus indicated his geological date, let us see what kind of being *Pithecanthropus* was. All that we have to guide us is a skull-cap, a thigh bone and three teeth—one of them an upper wisdom tooth or third molar.

The skull-cap, examined superficially, recalls that of the lowliest anthropoid—the gibbon. A gibbon to have a skull-cap of such a size would require to be as tall as a man instead of being—as all living species of the gibbon are—about the height of a five-year-old child. The roof of the



WHERE JAVA MAN LAY BURIED THROUGH THE AGES

When searching for the 'missing link' at Trinil in Java, a Dutch surgeon, Dr. Dubois, found in 1891-92 fossilised bones of the earliest type of man known to us, and called him *Pithecanthropus*—that is, Ape Man. The white cross in this photograph marks the point where the remains were unearthed.

From Trinil Expedition by Mme. Selenka

skull is flat and low; there is practically no forehead, for the great shelving ridges over the eye sockets run directly backwards into the crown; the back of the head—the occiput—in place of being full and bulging, as in modern man, was depressed and greatly curtailed.

Were we to confine our attention to mere external appearances we should be forced to the conclusion that this Pliocene representative of humanity was merely an overgrown gibbon. When, however, we begin to examine the size, shape and convolutionary pattern of the brain which lay within and under this skull cap we are compelled to form another opinion and to realize that in *Pithecanthropus* we have not only the earliest form of fossil man yet discovered but also the lowest evolutionary human form known to us.

Man's essential traits are his intelligence, his educability and his intensity of feeling; these qualities he owes to his brain. The story of Man's evolution is in reality that of the evolution of his brain, not of the outward appearance of his skull. When the skull-cap of Neanderthal man was discovered in 1857 certain skilled anatomists said that it betokened an anthropoid ape rather than a human being, for it had the massive eyebrow ridges of a gorilla and

the crown of the head was low, wide and flat. Subsequent discoveries have shown that in mass of brain Neanderthal man exceeded many of the living races of mankind, and his intelligence and skill are known to us by his bold and beautiful workmanship in flint.

Dr. Dubois found no implements in the fossiliferous bed in which the remains of *Pithecanthropus* lay; we have, as yet, no external evidence to guide us to the degree of his intelligence; but we may draw certain legitimate inferences from the brain-cast which Dr. Dubois ultimately succeeded in taking from the interior of the skull cap.

In point of size the brain of *Pithecanthropus*—or, as we shall name him hence-

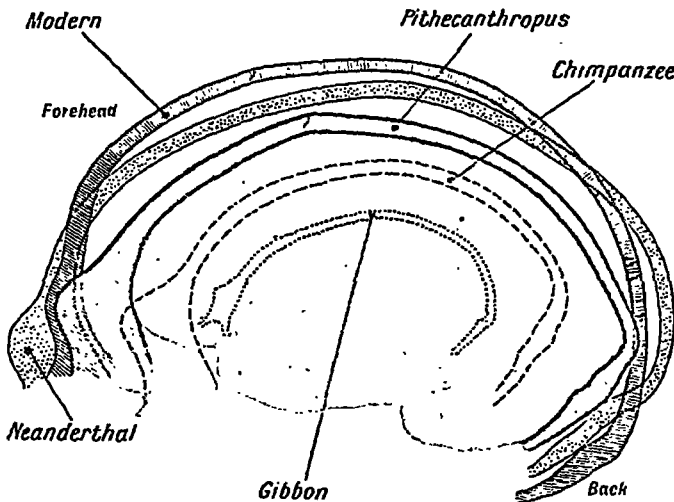
How then does the Java man stand in this respect? In his latest enquiries Dr. Dubois has been led to the opinion that in this specimen of Pliocene man the brain must, in its intact state, have measured 900 cubic centimetres; independent enquiries made by Professor J. H. McGregor give rather a higher figure—namely, 940. Thus we see that the fossil man of Java, in point of brain-size, stood on the threshold of humanity. We may well infer that his brain was just beginning to understand the simplest of things and that his behaviour was still largely dominated by instinct.

Let us see how the Java man stood in this respect to the largest-brained of living anthropoid apes—the gorilla. In the average male gorilla the cranial capacity is about 520 cubic centimetres, but there are individuals which rise as high as 650 and others which fall as low as 480. We have seen that the skull cap of the Java man has a striking resemblance to that of a gibbon, but when we compare their brain-casts we see how different they are both in form and size; in the largest-brained gibbon so far measured the capacity was only 150 cubic centimetres, whereas in the Java man it amounted to at least six times as much.

If we carry our comparison further and contrast him with higher living races we find that in size of brain he fell short of the average for male

Europeans by about 560 cubic centimetres, for we may take 1,500 as the amount which represents the cranial capacity of the average male European. In spite of great beetling ape-like eyebrow ridges and receding foreheads, individuals of the extinct Neanderthal species of mankind often exceeded this amount.

In point of size the brain of this Pliocene representative of humanity rises far above that of the largest known anthropoid ape and just reaches the bottom of the human scale. We arrive at a similar conclusion when we compare the size and arrangement



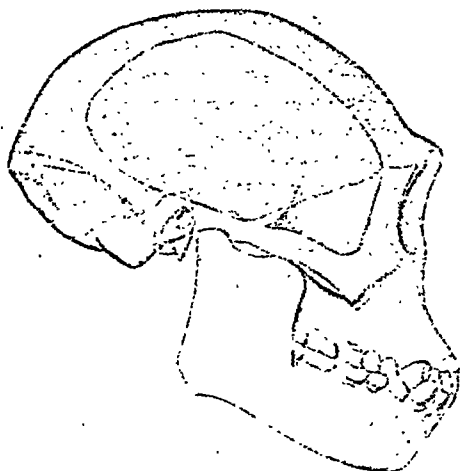
MAN NOT FAR REMOVED FROM THE APES

Although in shape the skull of the Java man is even more ape-like than that of Neanderthal man, and very different from a modern human skull, it differs considerably from those of chimpanzees and gibbons. In this diagram the cast of Java man's brain is shown in the interior of his skull.

forth, Java man—falls just below the human minimum. Among the aborigines of Australia, the brain space or cranial capacity varies in most individuals between 1,300 and 1,400 cubic centimetres (45·8 and 49·3 fluid ounces), but occasionally it may drop in certain individuals—particularly women—to 1,000 or even, as Sir William Turner had occasion to observe, to 930 cubic centimetres. For men and women to take a useful share in the life of their tribe it seems necessary that their brain mass must rise above a 950 cubic centimetres standard.

of convolutions on the Java brain cast with those to be seen on one taken from the skull of a gorilla and on another from that of an aboriginal Australian woman.

In all three casts the convolutions of the brain are seen to be arranged on the same basal plan, but in the Java cast the pattern has become essentially human. In the anthropoid brain we observe that all the primary areas of the cortex, or outer layer of the brain, which have to do with hearing, seeing and feeling are well represented; but the secondary areas—which give the power to understand, to discriminate and to remember—are still rudimentary. In the Java brain these secondary areas, although they have under-



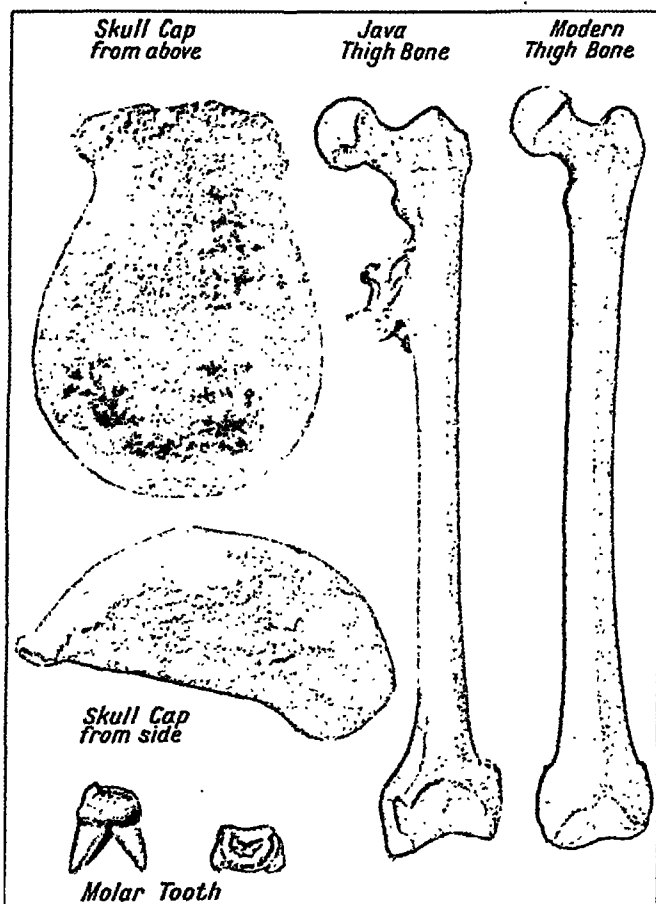
JAVA SKULL RESTORED

The brutish appearance of the earliest man discovered may be deduced from this restoration of his flat-roofed, low-browed, ape-like skull by Dr. Dubois.

gone a considerable expansion, fall far short of the development reached in even the lowest of living races.

Thus the discovery made by Dr. Dubois tells us that in the Pliocene Period—probably in the latter part of that period—there were in existence crudely fashioned human beings whose brains and mental faculties fell far short of those attained by modern man. We cannot tell for certain whether or not they had acquired the gift of speech, but in the brain cast of the Java man we can detect, in an elementary condition, all those areas which are concerned in speech, and probably some crude system of voice signalling had appeared. At least we may well suppose that Man's early attempts at speech are just as old as his first efforts at making tools.

If we accept the cerebral state of the Java man as the average level reached by

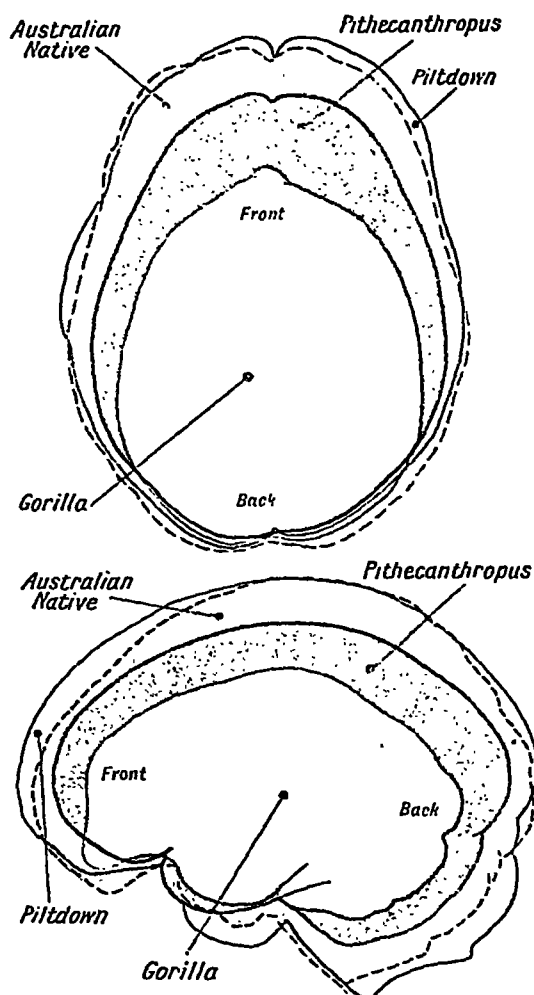


EARLIEST HUMAN BONES YET DISCOVERED

The most interesting of the Trinil bones is the skull-cap, which, although resembling a gibbon's, proves that Java man was more intelligent than any known ape. The large teeth have both human and simian affinities. His thigh bone (compare the human bone alongside) shows that Java man walked erect.

After Dubois

humanity in late Pliocene times, and that of Piltdown man as representative of the stage reached early in the Pleistocene, then the interval between their respective dates must have been the heyday in the evolution of the human brain. For in size the Piltdown brain, which measured about 1,400 cubic centimetres, rises well within the human standard, whereas the Java brain, if we accept the 940 estimate, still falls somewhat short of even the lowest modern standard. Piltdown man, although the higher or 'association' areas of his brain have not attained the fulness usually seen in the brains of lower races of modern man, yet in this respect far exceeded Java man.



JAVA MAN'S BRAIN DEVELOPMENT

The size and arrangement of the lobes and convolutions in the brain-cast of Java man are distinctly human; they differ from those of the gorilla's brain and approach those of Piltdown man and the aborigines of Australia.

We have lingered somewhat over the cerebral outfit of this unique specimen of Pliocene humanity for the reason already given: namely, that the brain is man's essential organ and that the story of his evolution is to be read in the rise and growth of the brain. We must not, however, neglect other parts of his anatomy.

The teeth of Pithecanthropus were human in shape, but of large size; we do occasionally in the skulls of Australian aborigines come across molar teeth which reach the dimensions of those which go with the Java skull. Dr. Dubois, in another part of Java, but in a stratum of the same age as that which yielded the skull, teeth and thigh bone, found part of a lower jaw; it contains the socket of the canine or eye tooth. This tooth in Piltdown man, it will be remembered, was large and pointed as in a young anthropoid ape, but the socket in the Java specimen is not large; in Java man the canine teeth had sunk into the same dental rank as their neighbours, just as was the case in the Heidelberg jaw and as is the case in all living races of mankind.

Are we to infer, then, that man's canine teeth, after undergoing reduction in the Pliocene Period, again renewed their growth for a while in the early Pleistocene, to relapse at a still later time to a smaller size? The explanation of this apparent anomaly we shall have to bring forward in a later part of this chapter, and in the meantime will merely state that we cannot explain these apparent contradictions unless we suppose that Pithecanthropus, Eoanthropus and Homo heidelbergensis represent separate and diverging branches in the great tree of evolving humanity. Of that fossil tree we have as yet discovered but a few isolated and broken twigs.

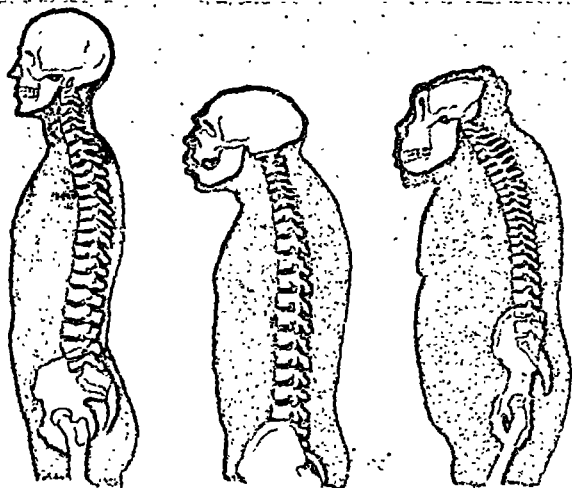
If Man's mental faculties are the most distinctive of his gifts, next to them, as marking him off from all other living animals, is the manner in which he holds his body and the mode in which he runs and walks. To assert that his is the only body modified to an erect posture is to go beyond the bounds of truth; we shall see that all the anthropoid apes, when they are in their natural arboreal habitat, carry

their bodies in an erect posture; every bone and muscle in their organization is set and shaped for this end. And yet their feet are still shaped as grasping organs.

Man has the same posture, only his feet have become modified as organs on which he can support the whole weight of his body. The human foot is shaped also to serve in Man's peculiar mode of bipedal progression. For this end the bones and muscles of his thighs and hips have undergone many structural changes; so, too, have his backbone and the very complicated system of muscles which balance it and move it. In their evolution all these three parts—foot, thigh and backbone—have been linked together; their structural changes have been co-ordinated. If we find a fossil bone of the foot or of the thigh or of the backbone we can tell whether or not the animal of which it had formed part had acquired Man's mode of progression. We therefore turn to the fossil thigh bone of the Java being.

That thigh bone is long and slender and is in every respect human; the individual of which it formed part must have held his body, run, jumped, walked and squatted much as we now see natives of Australia or of Southern India doing to-day. It is just as deeply fossilised as the skull; it is true that it lay nearly twenty paces from the skull, but this is just what might well happen when a human body decays and becomes dismembered in the bed of a running stream.

Certain minor features of this fossil thigh bone are rarely seen in modern examples, but in nowise does it show any special likeness to the thigh bone of anthropoid apes. Indeed, in this respect *Pithecanthropus* was more distinctively human than *Neanderthal* man; in that peculiar species of mankind the thigh bone still retained certain anthropoid traits. The Java thigh bone has marks of a certain



HOW MEN AND APES CAN STAND ERECT

An ape's bones (right) are so shaped and arranged as to allow of its assuming the erect posture if the necessity arises. Those of a Man's spine (left), with its triple curve, are definitely peculiar to him, since they are adapted only to his habitual upright gait. The spine of a Neanderthal is intermediate,

After Professor Boule

disease—one which we still meet with in human beings, but which has never been encountered in anthropoid skeletons. From the thigh bone we may safely infer that the Java man was a slender fellow, about 5 feet 8 inches tall, and that he held himself erect and walked just as we do.

Here, then, we have assurance that Man's posture was fully evolved before the end of the Pliocene period, and that if we are to seek the early stages in its evolution we must carry our search into a more distant geological period. But before doing so it may be well to call attention to the important fact that our remote fore-runners were men in posture long before they were men in mind, and that even so late as the end of the Pliocene period and the beginning of the Pleistocene the outward marks of the ape were still plainly visible in their skulls and in their jaws.

By means of records preserved in ancient tombs, caves, valley terraces and older geological deposits we have traced Man's history backwards into a remote past. In deciphering written history we begin with the earliest record and trace the sequence of events down the stream of time. In deciphering our imperfect geological records we have to reverse our

method ; we have to begin with the known and then proceed into the unknown ; we have to use the superior knowledge of every later period to interpret the events of that which immediately preceded it.

By means of fossil bones and rudely fashioned stone tools we have traced Man's history through the Pleistocene into the Pliocene Period,

A Journey through Tertiary Time and we must now set out again on a journey which will carry us into still

more distant phases of the Earth's history. Before doing so, however, it will be well to give a conspectus of the geological periods into which we are about to enter. It will be remembered that we employed a diagram to epitomise the chapters of Man's cave history ; we did the same for his terrace history ; we propose now to use the same method to summarise these later geological chapters with which we are now to be concerned.

From the diagram opposite it will be seen that as we pass from the Pleistocene into the Pliocene we cross a geological Rubicon, for as we cross this frontier the species of mammals which now inhabit the Earth seem to be replaced by others which differ from them in outward appearances. Hence geologists make the Pleistocene the first of a new series of chapters of the Earth's history. To this series is given the name Quaternary ; its first chapter, the Pleistocene, ended when the ice-sheet retreated to the Arctic circle ; the second chapter opened some ten or twelve thousand years ago, as the world of humanity began to take on its modern aspect, and when it became apparent that Man was destined to revolutionise the face of the Earth.

On the other hand the Pliocene Period, which lies on the farther side of this geological Rubicon, represents the fourth, and last, of another series of chapters—the series to which the title Tertiary is given. The preceding and third chapter of this series—the Miocene—covers a much longer period of time than does the Pliocene ; its superimposed strata are estimated to form a total thickness of 9,000 feet, against 5,000 feet for the Pliocene. If deposition of strata went on at the same rate during both periods, then, if we allow 250,000 years

for the duration of the Pliocene, we must allow 450,000 for that of the Miocene.

The second of the Tertiary chapters—the Oligocene—covers a still longer period, for its collective strata have a depth of 12,000 feet ; geologists give as a provisional estimate of its duration 600,000 years. Thus we reach the oldest or first of the chapters of the Tertiary series—the chapter which deals with the Eocene Period. The depth of strata formed in this period was certainly equal to, if not greater than, that formed in the succeeding Oligocene period. We may thus take another 600,000 years as a provisional estimate of its duration.

[The figures here adopted by Sir Arthur Keith give a total of nearly two million years for the Tertiary Era. It must be pointed out that in the opinion of many geologists thirty million would not be an over-estimate, and that no duration shorter than this can satisfy the demands of the physicists—see page 44. In any case the figures given in text and diagram may be accepted as providing a convenient and accurate guide to the *relative* lengths of the Periods under discussion.—EDITOR.]

The four chapters which deal with the Tertiary Era of the world's history are of prime importance to the student of Man's evolution, for they cover the rise of that great section of vertebrate animals which give suck to their young and all of which, with a few exceptions, bear their progeny in a womb. The provision of a womb, in which the young may be sheltered and nourished, and reach developmental maturity, marks a stage in the general evolutionary advance which ultimately made the emergence of Man possible. With the dawn of the Eocene Period mammals began to assume a great variety of forms ; they became the successful and dominant vertebrate type ; they supplanted more and more the older reptilian types.

Seeing that Man is in every respect a mammal, it is useless to cross another geological Rubicon and seek for his birth-place in the Secondary section of the Earth's history, for the chapters of that section cover the Age of Reptiles. The

**When Mammals
first arose**

Secondary chapters are named in the diagram in this page; they cover an enormous period of time; on the conservative scale, used in the reckoning of time adopted here, we may assign to the Secondary Era a duration of about six millions of years. It must not be thought, however, that at the Rubicon between the Secondary and Tertiary periods reptiles were suddenly replaced by mammals.

The records of the rocks show most plainly that even at the beginning of the Secondary section certain reptilian forms were being modified in a mammalian direction, and that these new forms

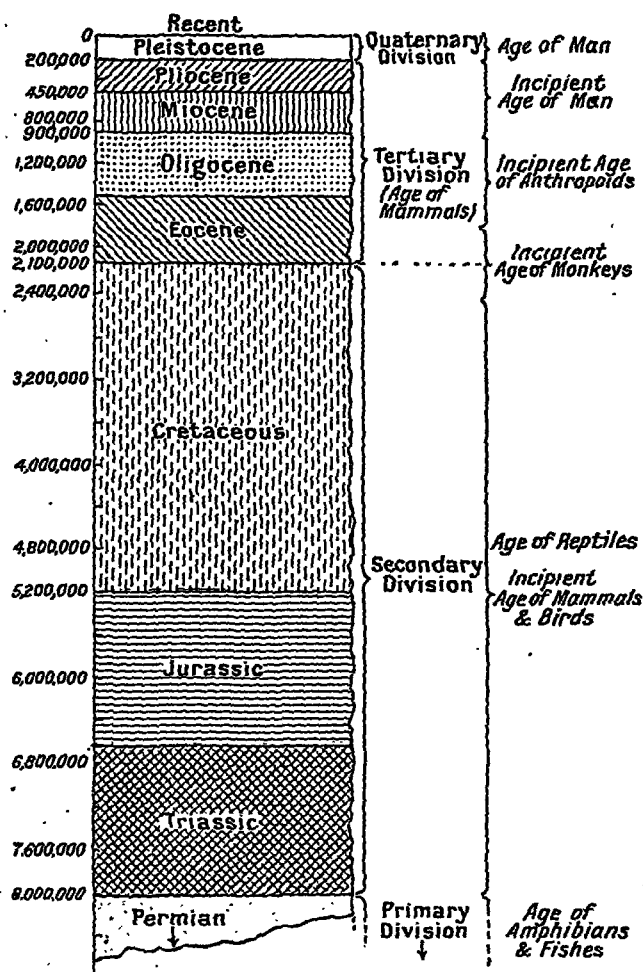
became more numerous and more and more highly differentiated as time went on, until at the end of the Secondary series there appeared the generalised mammalian types which specially mark the opening of the Eocene Period. Much less is it necessary for us to go still further back to that part of the immense Primary section of the Earth's history where fishes and amphibia represent the highest achievements in vertebrate evolution.

Having thus viewed in outline the Tertiary section of the Earth's history, we are in a position again to take up our quest for Man's origin. In the deposits of East

Anglia we have followed the trail of his rude stone implements back almost to the middle of the Pliocene Period; we have found in Java a representative of humanity who had been overwhelmed and entombed towards the end of the Pliocene Period. That representative was ape-like in skull, primitive in brain, but altogether manlike in posture.

Clearly, then, we have to go further back in time to find the evolution of Man's posture and the emergence of his brain from the anthropoid status. Hitherto, in their search for these transitional phases, students of Man's evolution have drawn blank. In none of the older Pliocene deposits have we yet found a bone or tooth which we can identify as definitely human; in no rock or deposit of that age have we found a stone which showed unequivocal evidence of Man's handiwork. Yet in strata of early Pliocene age there have been found traces of animals which provide an indirect clue to the objects of our search.

We have found teeth and fragments of jaws which tell us that great anthropoid apes were alive in tropical jungles during early Pliocene times. The fossil apes were not identical with the gorilla



CHAPTERS OF LATER GEOLOGICAL HISTORY

The Pleistocene Period, in which Man became dominant on Earth, is very much shorter than the periods of his emergence from lower mammalian forms. These periods are in turn recent and brief when compared with those during which terrestrial vertebrates have existed. This diagram is by Sir Arthur Keith.

or chimpanzee, or with the orang of Borneo and Sumatra, and yet they were heralds of the great anthropoid type—the type which is most akin to Man in structure. We know, too, that the small anthropoid apes, now represented by the gibbon and by the siamang, were then alive. So, too, were several genera of monkeys, none of them identical with present day generic forms, yet clearly related to them. In early Pliocene times Man's nearest allies certainly existed.

When our search is carried into deposits of the Miocene Period we can show as yet nothing which is positively human, but

no one who knows how
Giant primates of short our search has been,
Miocene Period and how many of our
geological records lie un-

opened, will decide on this account that Man was not in existence during Miocene times. The upper or later half of the Miocene Period was certainly one of great evolutionary prosperity in the anthropoid world. From strata of this period have been recovered fossil remains of at least ten kinds of great anthropoid apes—animals which equalled or exceeded Man in size of body. They were giants compared with all other forms of primates which had preceded them.

Man also is a giant primate, and the appearance of these great anthropoids in mid-Miocene times inclines one to the supposition that Man's forerunner may also have come by a separate existence then. Our knowledge of these mid-Miocene anthropoids is founded on fragments of jaw and isolated teeth, for these are the most resistant part of an animal's body, and therefore the most likely to be preserved as fossils. It is possible, as some geologists maintain, that some of these fossil fragments indicate the existence of an anthropoid ape which had already diverged towards humanity.

We cannot reach a reliable decision on mere fragments of jaw and detached teeth; we have already seen that ape-like characters of jaw may go with a human brain, as in Piltdown man. A fragment of a skull, a thigh bone or bones of the foot would, had one the fortune to find them, provide us with definite clues, but such have not yet been discovered.

We have reason to suppose that the great anthropoids of Miocene jungles, although they may have differed in structural details from the gorilla and other great anthropoids now living, were yet, in a structural sense, as highly evolved as their present-day representatives.

As contemporaries of the great Miocene anthropoid apes we find the forerunners of the small anthropoid apes of to-day—the gibbons. It is wonderful how little the teeth and jaws of the Miocene gibbon (*Pliopithecus*) differ from those of the animals which still abound in the forests of farther India and the great islands of the Malay Archipelago. In Miocene jungles the Old World monkeys had also appeared, and it is strange that they should have undergone, in subsequent times, a much greater degree of evolutionary change than did their cousins, the small anthropoid apes.

Thus we have the best of reasons for supposing that if a zoologist from a neighbouring planet had visited our tropical forests as they existed some 700,000 years ago, he would have

Anthropoids
but no Men

found all the higher members of the order of primates already represented, with one exception—namely, that of Man. Great anthropoids, small anthropoids and monkeys had certainly come into existence by the middle of the Miocene Period. Was the Miocene ancestor of humanity still in its anthropoid stage then, but so like to the great Miocene anthropoids that we could not distinguish him from them even if we had the fortune to come across his actual remains?

Seeing how completely the human body had become adapted for bipedal progression before the end of the Pliocene Period, it seems necessary to infer that human and anthropoid lines of evolution had parted at least by the beginning of the Miocene Period—a matter of a million of years ago. It is possible that human and anthropoid lineages may have separated at an even earlier date—somewhere in the Oligocene Period.

We are now to take another vast stride into the past—one which covers at least half a million of years, and carries us to

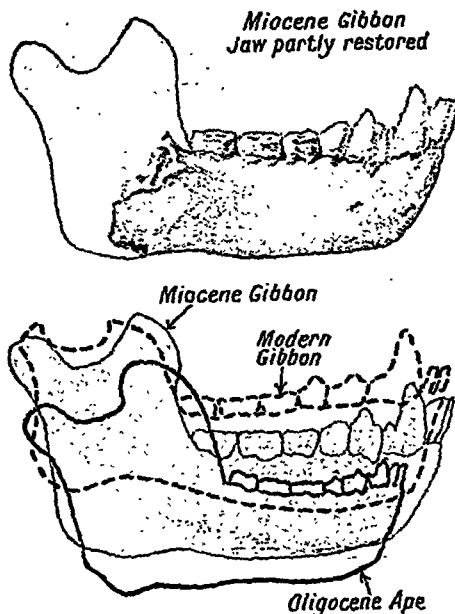
an early point in the Oligocene Period. At this time North Africa, including the desert regions of the Sahara and of the Sudan, was clothed with jungle and drained by a mighty river which carried its sweepings towards the north and west and deposited them as an enormous delta in and near the lands which are now included in Lower Egypt. In the Fayum, sixty miles to the south-west of Cairo, these delta sweepings now appear as massive cliffs of stratified rock, rich in fossil remains of the varied forms of animal life which inhabited the northern half of Africa in an early part of the Oligocene Period.

These rocks have been searched successfully for fossil remains in later years. We are concerned at the present moment only with representatives of that order to which Man belongs—the order of primate mammals. In 1910 important discoveries were made. Teeth and fragments of jaws of three curious kinds of primates were found. The first feature

Three small of these very ancient Monkey ancestors primates to seize our attention is their small size; they were no larger than the South American marmoset; in bulk of body the gibbon exceeds them just as much as the great anthropoids outdo the gibbon. Yet one of them, to which the name *Propliopithecus* has been given, clearly foreshadows the gibbon; it may well be the Oligocene ancestor of the small anthropoid ape of the Miocene Period and of our modern gibbons.

Another of these small Fayum fossil primates seems to be an early generalised form, related to the ancestry of the gibbon and to that of Old World monkeys, and also showing affinities to New World monkeys. In it one can see evidence also of a relationship to a still older form of primate—the Tarsioids of the Eocene Period. The third fossil primate is small in size and may be an early stage in the evolution of Old World monkeys.

The Fayum gives us the only glimpse we have obtained so far of the anthropoid world of Oligocene times. That glimpse is sufficient to show us that we have reached very near to the evolutionary infancy of the anthropoid type—to a



RESEMBLANCE AFTER 800,000 YEARS

When we compare their jaws, we find that the gibbon of the Miocene period seems greatly to have resembled its modern descendant. The small Oligocene ape, however, from which the gibbons probably evolved, was much more primitive.

After Sir Arthur Keith

time when monkeys and anthropoids which now seem so far apart were still the closest of cousins in a structural sense. The records of the Oligocene rocks seem to tell us very plainly that in them we have reached a point in the world's history when there was neither Man, anthropoid nor monkey—but only the generalised beginnings of these great families.

Nor would our present search be carried into that more distant past represented by the vast deposits of the Eocene period, were it not that one of the most gifted anthropologists of to-day, Prof. F. Wood Jones, has given his support to a theory which carries Man's separation from other members of the Primate order back to the Eocene—the phase when the mammalian stock began to differentiate into its various lines of evolution.

In Eocene deposits, particularly in those of the United States and of France, are found the fossil remains of very many kinds of primate mammals. All are of small size and the predominant type was that which has been perpetuated in the lemurs of to-day. There was also another

prevailing type, one which was more monkey-like and to which the name Tarsioid has been given. To-day this ancient type has but one living representative—the small, quaint, nocturnal goggle-eyed Tarsius, or tarsier, of Bornean jungles. Professor Wood Jones believes that we shall ultimately find a series of fossil forms which will carry Man's origin right back to a Tarsioid ancestor of the Eocene Period—thus giving human history a duration of between two and three million years.

In the opinion of those who have given the evidence from all sources their close attention, this is most unlikely to be the case. In a later part of this chapter reasons will be adduced in favour of the thesis which derives Man and anthropoid from a common ancestry and maintains that the separation of Man from anthropoid did not take place until about the beginning of the Miocene Period. Even on this theory Man's history has the respectable antiquity of about a million years.

We have now finished our survey of Man's history so far as it can be written from records which have been preserved for us in rocks and other geological deposits. My readers may be impressed by the great blanks in our knowledge of Man's past; it may appear to them that what we have deciphered so far makes up but a few fragmentary pages of a missing volume. They will do well to remember that a century ago not a page of this new history of mankind had been recovered; nay, a century ago we did not even know that Man had a history beyond that given to us by Mosaic records.

And now every year sees the material for a number of new paragraphs recovered; every decade sees a more rapid progress than was made in the preceding ten years; we have every reason to hope that the great blanks which still mar our geological history of Man will ultimately disappear and that by means of fossil forms we shall trace him back until his lineage sinks into the general primate stem. Even should this optimism prove ill founded, there are other sources, be-

sides geology, which can supply the data of Man's remote history, and it is to one of these other sources that we now turn.

In the height of a holiday season a traveller may see, in a single day's journey, all stages in the evolution of a railway carriage, from luxurious Pullmans to rude vehicles which are little better than cattle trucks. He may ride behind a modern mammoth engine or be drawn by one which still retains the simplicity and antiquity of a 'puffing Billy.' In the yard of a country station he may obtain, as he passes, a glimpse of the motley crowd of vehicles which await passengers—an ultra modern motor car or an ancient one which in its lines proclaims its descent from the horse-drawn phaeton; the squire's carriage may be there with cockaded coachman behind dappled greys, or the farmer's wain waiting for a picnic party of village children.

Nay, as our traveller enters remote parts of the country he may even see horses yoked to a sledge dragging a heavy log or a great stone over a ploughed field. Thus in the course of a single day a modern traveller may see in use many stages in the evolution of cars and carriages. If he were to proceed to dissect the various examples, as anatomists do the bodies of dead animals, he would soon perceive which of them were simple and old and which were complicated and new, and would be able to make a reasoned guess as to the order in which each made its appearance in the industrial world.

He could then write a history of the order in which they were invented; but if he wanted to discover the years in which each of such inventions was made he would have to appeal to the old files of newspapers or to standard encyclopedias, just as the anatomist has to appeal to geological records when seeking for the dates at which new forms of animals made their appearance. It is in this way that the comparative anatomist seeks to write Man's history; he compares Man with other animals, and on the facts thus gleaned is able to tell the order in which each form made its appearance.

We can still see in use vehicles which illustrate steps in the evolutionary ladder by which modern railway carriages and motor-cars have reached their present equipment and state of efficiency. In the world of to-day we find certain peoples, such as the aborigines of Australia, living in a stone age, and other nationalities, such as those of Europe and of North America, participating in a new and very complex mode of life ; between these two extremes we find all intermediate stages of civilization.

By studying and comparing the grades of culture as manifested in diverse countries of the modern world it is possible to construct the evolutionary ladder by which Man's highest civilization made its ascent from the lowest savagery. Such studies provide the materials from which we can write a history of Man's cultural ascent. Similarly, when we proceed to write the pedigrees of living things—for a pedigree is a form of history—we adopt the same method.

For example, a zoologist, on comparing fishes, amphibia, reptiles, birds and mammals which are in the world to-day, would find many reasons for placing fishes at the bottom of the evolutionary ladder ; amphibians and reptiles give him stages which lead on towards mammals ; he therefore presumes that mammals, before they reached their distinctive positions, had passed through amphibian and reptilian stages in their evolution. Similarly, the student of birds is struck by the resemblance of their anatomy to that of reptiles, and presumes

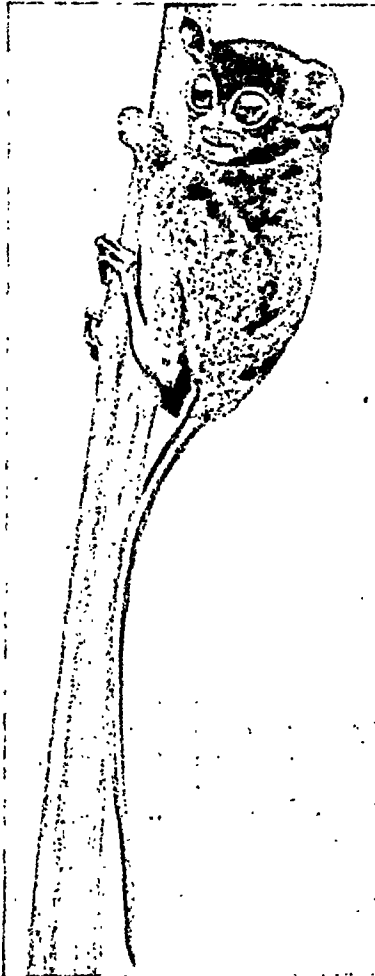
that birds, although they have become so unlike mammals in outward appearances, must also, like them, have passed through amphibian and reptilian stages in their ascent from fishes.

It is true that the geologist has told the zoologist that in the record of the rocks fishes appear before amphibia and amphibia long before reptiles, and that reptiles antedate mammals and birds in the order of evolution ; yet although the zoologist is grateful to the geologist for this information, he is quite capable of reaching reliable conclusions concerning evolution-

ary pedigrees by his own methods. For the zoologist has perceived that when nature or Man modifies an old thing to serve a new purpose, the old thing is not necessarily discarded.

When the farmer's wagon was modified so as to serve the needs of the squire's lady the original wagon was still used for agricultural purposes ; both the original type and the modification of this type survived. When a certain form of fish was modified so that it could move on land by limbs and breathe air by lungs the original fish type still survived. And so, when certain of the early reptilian types began to assume a mammalian organization, others still went on maintaining a reptilian conservancy.

Indeed, it may be said that nature has never sought to cover or hide her evolutionary tracks ; by fossil forms buried in orderly sequence in the strata of the earth she proclaims the mode in which she has worked ; amongst her living forms the comparative anatomist can still detect



MAN'S REMOTEST PROGENITOR ?

The tarsier of Bornean jungles is the only living representative of the Tarsioid primates found in Eocene deposits. Man's lineage, some think, may have branched off from these.

Photo, Dr. Le Gros Clark



WHAT CAVE MAN MAY HAVE LOOKED LIKE

Neanderthal man was not an ancestor of *Homo sapiens*, but formed a separate species now extinct. Despite his rather ape-like appearance, he lived in caves, knew the use of fire and could manufacture excellent flint implements. This bust is modelled on the skull found at La Chapelle-aux-Saints.

Restoration copyright by Dr. J. H. MacGregor

the stages by which she has reached the most daring results of her activities. We may be certain, then, that when we come to examine that corner of the animal kingdom where Man finds his place we shall find living forms which represent stages in his evolutionary ascent.

To illustrate the manner in which the biological history of Man is written we could not do better than consider the various living races of mankind (see Chap. 5). If what has been said is true, then some of the living types must illustrate stages through which the highest type has passed in its evolutionary ascent.

Among living races the Australoid type is unquestionably the lowest. Of the

fossil types of Man so far discovered there is only one which, in the assemblage of its characters, can serve as a progenitor of this type, and that is the remarkable being known as Rhodesian man (*Homo rhodesiensis*). His skull and some of his limb bones were found deep in the Broken Hill Mine, North Rhodesia, in 1921, in the same deeply fossilised state.

As to the exact geological antiquity of this type of human being there is still a lack of evidence; Rhodesian man probably inhabited Africa when Neanderthal man was living in Europe. His supra-orbital ridges are the most massive known in a skull which, in its other characters, is human. In this character Rhodesian man resembled the gorilla, as he also did in the massive size of his face and jaws.

His brain was almost equal to that of the average Australian aboriginal but less highly evolved. In the form of his limb bones, and also in many of his cranial features, he resembled the Australoid type. Rhodesian man, in a crude manner, foreshadowed the modern Australoid.

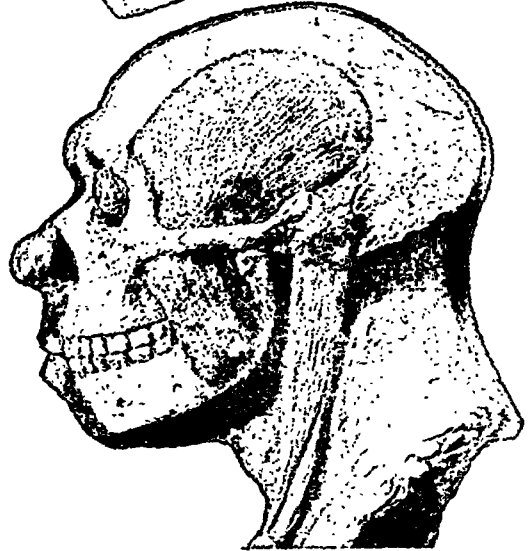
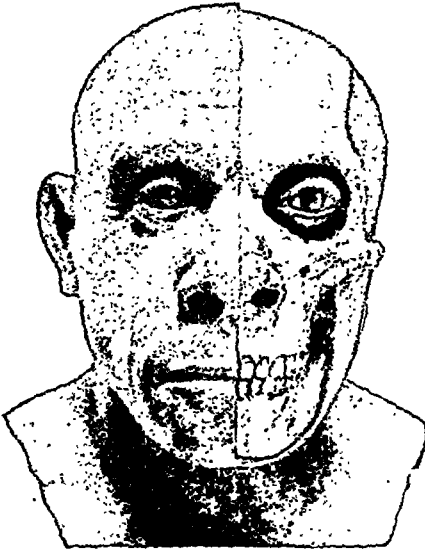
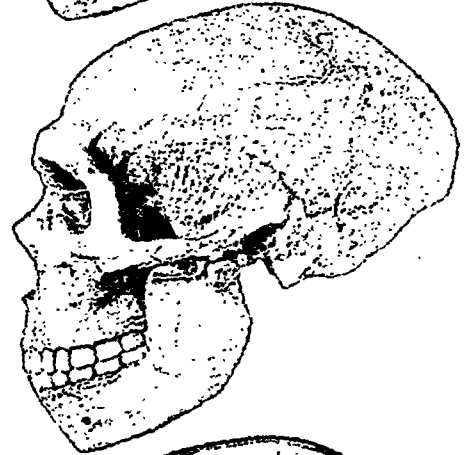
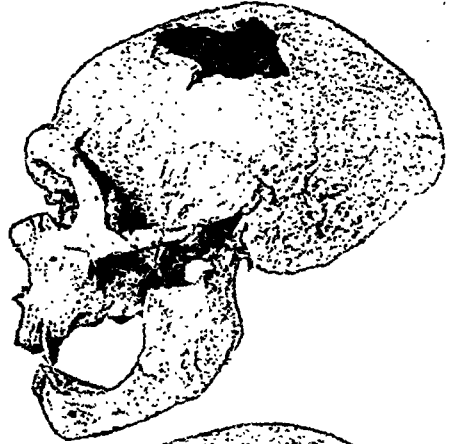
The zoologist uses the word family in a strange sense; when he speaks of the Human Family, he includes under this term not only all living races of mankind, but such extinct types as those represented by *Pithecanthropus* (Java man), *Eoanthropus* (Piltdown man), the Neanderthal type, the Rhodesian type and the Heidelberg type. No doubt scores of others will be added as deposits become more fully explored.

For the zoologist, every primate which holds its body upright, uses only its lower limbs for progression and has a brain which attains a certain volume—fixed provisionally at 950 cubic centimetres—is a member of the Human Family. Likewise the

great anthropoid family includes very diverse members. Three of them are still living and can be studied, namely, the gorilla and chimpanzee of Africa and the orang of Borneo and Sumatra ; we know of at least ten extinct forms.

In this family are included primates which have a body equal to that of Man in weight—or even heavier, for male gorillas may turn the scale at thirty stones—not due to fat, but to muscle, bone and inward organs. Their backbone, ribs, muscles of the body wall and viscera are shaped so that the trunk during progression may be carried in an almost upright position. Their lower limbs and feet are so modified that they can support the weight of their bodies, but the toes are long and used for prehension, during arboreal progression. Their arms are long and are constantly employed in progression, particularly in climbing, but are also needed for support when walking or running on the ground. Their fingers are long and thick, their thumbs short and stumpy ; their hands are heavy and ill adapted for the finer acts of manipulation.

Their bodies are covered with hair, but that hair has a structure and texture more



HOW THE LIFE-LIKE HEAD OF NEANDERTHAL MAN WAS RECONSTRUCTED

The Chapelle-aux-Saints skull is shown in the two top photographs, in its original condition and accurately restored. The prominent eyebrow ridges, flattened cranium and heavy jaw are typical of the Neanderthal race. Below, we see a head, full face and in profile, modelled on this skull ; from one half of it the 'flesh' has been removed to show the bone and the large muscles.

Restorations copyright by Dr. J. H. MacGregor

reminiscent of human hair than that of any other family of animals. Their skin is deeply pigmented; that of the gorilla is black; the skin of the chimpanzee darkens with age, pigmentation increasing rapidly in some varieties. The arrangement and shape of their alimentary organs are remarkably like those of Man: all have a vermiform appendix. Their lungs and other parts of their respiratory system resemble Man's very closely. Their jaws, teeth and muscles of mastication are much more massive than are the same parts of the human body. Females carry their young for the same period of months as women do, and they suckle and nurse their young in the human way.

Although the great anthropoid brain outlines in its pattern the human organ, yet it falls far short of it in elaboration

and in size. In adult animals it never falls below a lower limit of 300 cubic centimetres, nor

ever rises above a higher one of 650. They can express their feelings by vocal sounds, grimaces and bodily gestures, and can indicate their needs by certain crude signals. They are experts in their own routine of jungle life, but outside that routine their intelligence falls far short of that manifested by young children of the lowest human races. They build scaffolds to serve as beds and sleep huddled up on their sides as children do. Although their brains have not reached the level at which articulate speech becomes possible, yet in their facial expressions and bodily gestures they are the most human of all animals.

No matter in what respect we compare Man, as represented by the Australian aboriginal, with any other living animal, whether it be in likeness of structural detail, habits of body, mode of life or in manifestation of feeling, the great anthropoid comes out as his nearest ally. The great anthropoid family stands next in the evolutionary scale to the human family, and it is therefore to this group that we must turn if we are to realize the prehuman stages of Man's history.

The great anthropoids and Man have so much in common that we must suppose, to account for the extent of their common

inheritance, that they have arisen from the same ancestral stem.

In their outward appearance Negro, Chinaman and European seem to be very different kinds of human beings, yet in the essentials of structure they are almost alike. Text books written to guide medical students as they dissect the bodies of Europeans serve equally well when members of other races have to be anatomised.

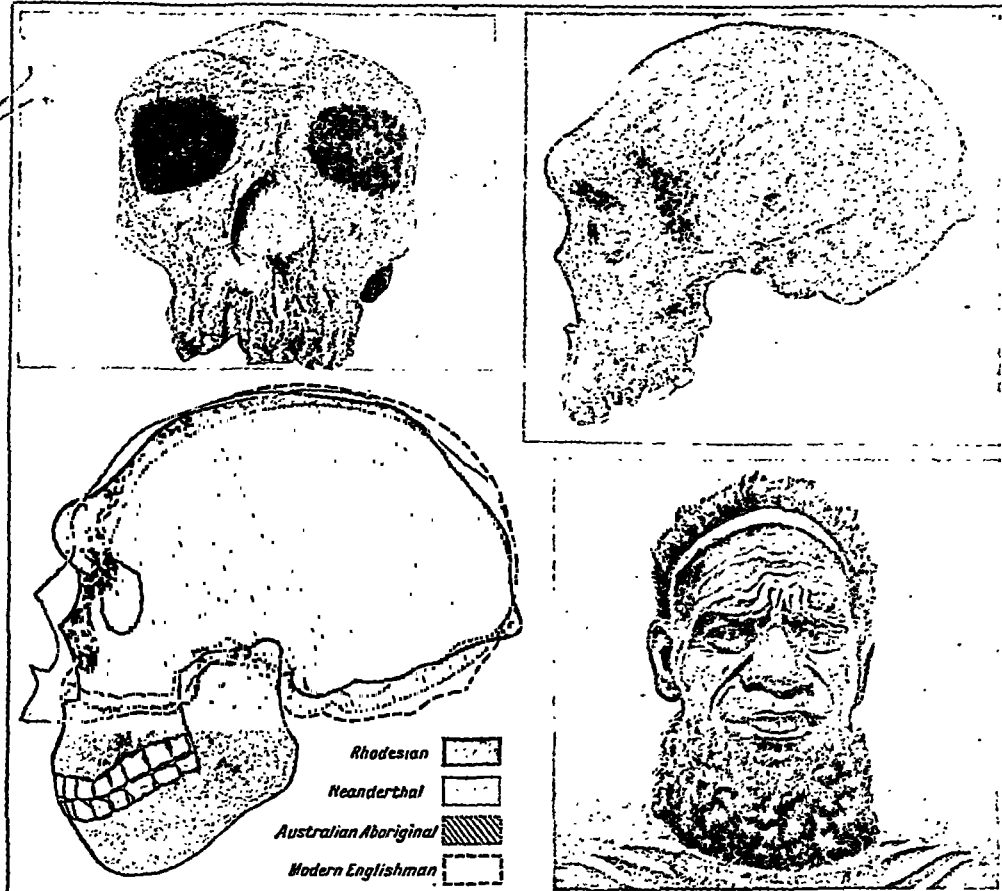
But let us suppose a manual has to be written to serve as a guide in the dissection of great anthropoids. The degree of structural divergence between the chimpanzee and gorilla on the one hand and the chimpanzee and the orang on the other are so great that in reality three books are needed. The differences, it is true, are not deeply seated; they relate merely to a multitude of structural details. The degree of divergence between the chimpanzee and orang is very much greater than between the chimpanzee and gorilla, which are evolutionary cousins.

This high degree of structural divergence between the members of the great anthropoid family has a very direct bearing on our conception of the earlier stages in Man's evolution. So alike are modern races that one

dissecting manual serves for all. But if it had so happened that past types of mankind had survived, and that a medical student of to-day had been called on to dissect such varying forms as Neanderthal man, Piltdown man and Java man, then a manual designed for the dissection of modern races would no longer answer his needs. He would really require a series of books as different from each other as manuals on the anatomy of gorilla, chimpanzee and orang.

Thus we see that the human family of ancient times was, like the great anthropoid family of to-day, made up of members which diverged from each other to a major degree in structure of body. Such an observation leads us to realize that if we are to obtain light on the earlier phases in the evolution of humanity we must seek it in the anthropoid world of to-day.

When the student of modern races begins to enquire into the life led by the members of the great anthropoid family



SKULL OF ONE OF MODERN MAN'S MOST PRIMITIVE HUMAN ANCESTORS

In its eyebrow ridges and length of its face, the fossilised skull (above), found in Rhodesia, is more gorilla-like than the Neanderthal skulls, though resembling them in other respects. Certain of its features, however, link it more closely with modern skulls, especially with those of the Australoid aborigines. Thus, Rhodesian man may be a forebear of the living Australian (bottom right).

Skulls by courtesy of Dr. Bather, British Museum, Natural History

he is impressed by the meagreness of their populations and the narrow limits of their homelands. In our modern world of humanity we see a single racial type packed in dense millions throughout the length and breadth of a continent. When we proceed to study the orang in his native territories we find him restricted to two areas of tropical jungle—one crossing Borneo from west to east, the other in the north-western half of Sumatra.

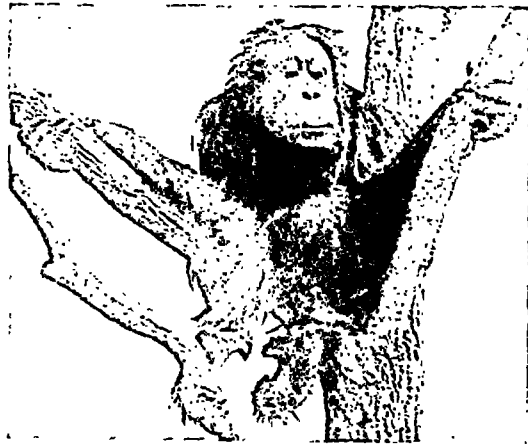
We may toil in the sweltering heat of their native territory for a whole day and never obtain a glimpse of one of them. If we have the fortune to fall in with a troop it is of small size, including a male or two, three or four females and perhaps four or five young of varying ages. No

census of the orang population has ever been taken, but on such evidence as travellers and hunters have made available we may infer that their total number is well under 10,000, not equal to the population of a minor country town. They breed wonderfully true to type; there are no well differentiated breeds, and yet Dr. Selenka found that skulls in one locality differed slightly from those in another.

The orang is restricted to the jungle; the anatomy of his trunk and limbs has been modified to serve the needs of a pure arboreal existence. His arms have become enormously long and strong and are used to suspend his body in an upright or orthograde posture as he makes his leisurely hand-over-hand progression

among his native branches. His hands have become long, clasping hooks. His lower limbs have undergone retrograde changes and play but a secondary rôle in his arboreal movements. The specialisation of his body for a life in trees has proceeded so far that when Borneo and Sumatra become invaded by planters this lethargic philosopher of the jungle must disappear.

Of the rich array of great anthropoids which inhabited Asia in Miocene and Pliocene times, the orang is the only



gorilla live in the tropical forests of Africa. The chimpanzee has the wider distribution; it is found in jungle lands along the western coast of Africa from Sierra Leone in the north to the mouth of the Congo in the south. Its homeland extends across equatorial Africa until the central lakes and sources of the Nile are reached.

Of all living anthropoids the chimpanzees have the firmest hold of life; when young they are lively and playful; they become sedate and more pugnacious in their adult years. They grow up more quickly than we do, becoming full grown by their twelfth or thirteenth year, and are in senility at the age of forty. In weight of body they resemble the slighter races of mankind: the male is the stronger, heavier and more pugnacious; in body and mind the male differs from the female much as a man differs from a woman. Among gorillas and orangs the sexual difference is much greater.

The traveller in African forests, and in the glades which intersect them, comes across chimpanzees living in families or groups, in which there may be as many as fifteen individuals of both sexes and of

survivor. The remoteness of his homeland has saved him just as the isolation of Australia protected its aboriginal inhabitants. When we have obtained a glimpse of how the orang lives, and the fate which awaits him, we are in a position to realize the conditions under which the earlier branches of mankind evolved and how they passed into the limbo of forgotten things. We may be sure that *Pithecanthropus* and *Eoanthropus*, besides being sharply differentiated in structure, were few in number and restricted in their distribution, and that they are but two of an exceedingly large number of extinct forms of humanity.

We shall learn still more concerning the earlier phases of Man's evolution by marking how the chimpanzee and



ORANG: GREAT APE THAT AVOIDS THE GROUND

The orang has become purely arboreal, and has developed accordingly: its arms, by which it swings from tree to tree, are long and powerful, its legs are unimportant and its feet secondary hands that can grip branches. Like the other great apes, the orang builds a nest, like this, in which to sleep.

Photos, W. P. Dando and Jarrold & Sons

all ages. Each family appears to confine its beat to a certain area or territory of jungle land. They live on the produce of the season—fruit, shoots, buds and insects. In their mode of climbing and walking we probably see the original methods of the great anthropoid stock. When they climb they use their arms and legs to about an equal degree and carry their bodies in an erect or semi-erect position. They submit to confinement and domestication more kindly than either the orang or gorilla; indeed, the latter usually sulks and dies when removed from its native habitat.

The chimpanzee possesses an insatiable curiosity, a faculty for imitation, a limited power to invent and adapt and some capacity for education. Although in its mental manifestations the chimpanzee does fall many grades below the lower human limits, yet in its mode of expression it approaches nearer to Man than



AN INTELLIGENT ANTHROPOID

Although their brains are smaller than those of orangs or gorillas, chimpanzees are gentle, tractable and quick to learn, and capable of a limited amount of spontaneous invention.

Photo, Neville Kingston

either the gorilla or orang. In volume of brain it stands below both of these. The cranial capacity of the average male chimpanzee is about 400, in the male orang 440, and in the male gorilla 520 cubic centimetres.

The total chimpanzee population is unknown; it is sparse and scattered and probably does not number 20,000. Local races or species have been recognized, but in no case is the difference between the



CHIMPANZEE WALKING UNSUPPORTED

Chimpanzees can walk upright, but their gait is clumsy and uncertain. They normally use their powerful arms as much as their legs as means of progression.

Photo, H. J. Shephson

various races so great as that which separates the Negro from the European or the European from the Mongol. Chimpanzees, like orangs, can live only in a wooded tropical country; when equatorial Africa becomes covered by plantations they must disappear.

Of all living great anthropoids the gorilla holds the highest place in the interest of the student of Man's evolution. He is the giant of anthropoids; he is the most massive and muscular of any ape known to us either in a living state or from the study of fossil remains. The fully grown male may weigh as much as thirty stones; the teeth, jaws, cranial crests and muscles of mastication of the male reach a point of development which leave the male orang far behind. Yet the gorilla brain, both in its mass and in its convoluntary pattern, marks the highest point in the anthropoid scale.

In its nature the gorilla is the most fierce, the most intractable and independent of all the anthropoids; even the young are morose, untamable and unteachable, and rarely live long in confinement. Gorillas are gross feeders with large stomachs; their staple diet is the young shoots and leaves of bamboo bushes and such buds and fruits as may be in season. They are pure vegetarians. They live in the same part of Africa as the chimpanzee, but their area of distribution is not as wide; their scattered bands, containing five to ten members, are found in jungle-covered areas between the Bight of Biafra on the west and Lake Tanganyika on the east; they occur in Gabun and in the Cameroons; they do not live to the south of the Congo.

In the members of a local troop variations in the colour and arrangement of hair may be seen and also variety in the contour and shape of the

Highlanders among the Gorillas face. In the mountainous region to the west of Lake Tanganyika a real race of

gorilla highlanders has become evolved. These highlanders differ from their lowland cousins in the length and profusion of their hairy covering, in their physiognomy and in possessing a great crest or pad on the crown of their heads. The total population of gorilla-land in all probability is under 5,000 and the number is fast dwindling.

In following out our present aim, which is to throw light on the origin of Man, the gorilla is of special interest to us because it possesses certain structural features which closely resemble those found in Man. It is clear that a weight of thirty stones handicaps an animal's agility and its power of climbing; a male gorilla would have difficulty in finding branches strong enough to carry him direct from tree to tree.

All recent travellers agree that the male gorilla, although he lives in countries densely covered by forest and jungle, rarely climbs; he is seen at his best when scurrying through thickets of bamboo. With his long, massive, strong arms he bends aside or breaks the stout bamboo stems, while he secures firm foothold by seizing the lower joints of the stem as he

forces his way through dense masses of undergrowth. On open ground he supports the main weight of his body on his lower limbs and feet, the heels and soles of which are massive and wide; as he limps along he uses his arms as crutches with bent knuckles applied to the ground. His gait is clumsy and heavy.

When his wife and family, more facile climbers, retreat to the branches of a tree for rest or sleep, he seats himself at its foot, reclining against the trunk. Thus the male gorilla has taken to the ground, and leads just such a life as Darwin supposed Man's anthropoidal ancestor had adopted in his first steps towards the adoption of the upright posture.

When we examine the foot of a gorilla we find, in spite of the thumb-like great toe, that in shape and proportion it makes an approach to a Man's foot. In all primates the foot is made up of three elements: the hinder or tarsal; the middle or metatarsal; and the anterior or digital element. The outstanding features of the human foot are the length or massiveness of the tarsal element, which includes the heel, and the shortness of the digital or toe element. In this respect the foot of a chimpanzee seems to have moved halfway from an original monkey-like state to a man-like state.

In its proportions the foot of the gorilla marks a stage towards a human foot. In the majority of human beings, but not in all, there is a special muscle—the 'peroneus Muscles of Gorilla tertius'—which serves to and Man

turn upwards the outer border of the foot and thus applies the sole directly to the ground. This special muscle appears in about ten per cent. of gorillas; in no other primate has a peroneus tertius been evolved except in Man and the gorilla. Then when we turn to the muscles of the calf, which is a characteristic feature of the human leg, we find one muscle—the 'soleus'—with a peculiarly wide attachment to the chief bone of the leg, the tibia. In the majority of gorillas we find that the soleus has also an extensive attachment. Then when we examine the muscles of the spine and those which are concerned in balancing the body on the hip bones we find



GORILLA: GIANT DENIZEN OF WEST AFRICAN FORESTS AKIN TO MAN

Of the great anthropoids, the gorillas have the largest brains and bodies—this magnificent specimen from the Cameroons was 7 feet high when standing upright. A study of their anatomy shows that, physically at least, they are more closely related to Man than are chimpanzees, orangs and gibbons, since certain of their muscles and bones bear a great resemblance to the corresponding parts of the human body, and do not take quite the same form as those observed in the other apes.

the gorilla sharing in certain of Man's characters.

Man has a special muscle for extending the first or basal joint of his thumb; this special muscle occasionally appears in the thumb of the gorilla, but has never been seen in any other primate. In all climbing primates there is a certain muscle known as the 'latissimo-condyloideus'; it is placed on the inner side of the upper

arm and assists an animal, when it has seized an overhanging branch, to raise its body towards its hand. In the chimpanzee this muscle is still present; in the gorilla the muscular contracting substance has almost been replaced by inert fibrous tissue; in Man's arm we find only a fibrous vestige, although in occasional subjects we may still see certain traces of its original muscular nature.



THE FOOT OF MAN AND THE GORILLA

A human foot (left) and that of a gorilla (right) do not differ greatly in structure although externally they are not at all alike. The latter, with its short, easily movable, thumb-like great toe has something of the appearance of a hand.

The nose of Man is one of his characteristic features—its prominence, and particularly the size of the wings which bound the nostrils. The gorilla's nose is also winged—much more so than is that of the chimpanzee or orang. The nasal bones of the orang and also of the chimpanzee have become greatly reduced, as in the Mongolian and Negro races of mankind, but in the gorilla they are long and strong.

When we take into consideration the relatively large brain of the gorilla, the adaptation of its feet and legs to serve as the main support of the body, its tendency to abandon a strictly arboreal life and all the other human resemblances enumerated above, we are compelled to admit that the histories of this giant primate and of Man must have been closely linked together at some remote period.

It has been necessary to make cursory visits to the native lands of living great anthropoids to obtain an answer to a very difficult question concerning Man's origin: namely how, and when did Man come by his peculiar posture and gait?

We have seen that all of the great anthropoids sleep as Man does, in a recumbent position. We have also seen that when they climb or attempt to walk they hold their bodies in an erect or semi-upright position. One member, the orang, in climbing uses its arms more than its legs to support and propel its body; the chimpanzee uses upper and lower limbs to about an equal extent; in the gorilla the lower limbs take a greater part than the upper in supporting and propelling the body; in Man the lower limbs have taken over the whole duty of progression and set the arms and hands free to become the nimble agents of his brain.

In the structure of their bodies all these giant primates—Man, gorilla, chimpanzee and orang—have such an overwhelming series of structural features in common that we must suppose them to be the co-descendants of a common ancestry. The question thus comes to be: Which of the four surviving forms has retained most closely the characters, habits and posture of the common ancestor?

A survey of living human races leads us to conclude that the aborigines of Australia retain more of the common ancestral type than any other. An examination of the anatomy of living anthropoid apes elicits evidence which leads us to select the chimpanzee as the least changed of living forms.

Ancestor of
Man and Ape

It is true, as we shall have reason to mention presently, that in certain respects, particularly as concerns characters of tooth and skull, the chimpanzee has altered during recent geological periods, but we may look on its posture of body, the proportions of its limbs, its mode of climbing and the general arrangement of its bones and muscles as very similar to those of that remote ancestor of which we are now in search.

We need a name for this missing ancestor of the great anthropoids, and as zoologists at one time used the convenient though erroneous term *Troglodytes*, or cave-dwellers, to designate the African anthropoids, we may speak of the first or earliest of the great anthropoids as *Prototroglodytes*. We know that in the middle Miocene times many forms of

great anthropoids were in existence, especially those to which the name *Dryopithecus* (tree-ape) has been given; so we must infer that the Prototroglodyte ancestor had come into existence in an early phase of the Miocene, or even before then, in a late stage of the Oligocene Period. The fossil fragments of teeth and jaws of the Miocene anthropoids do not help us to build up a flesh and blood picture of the original great anthropoid; to do this we have to reconstruct its image from the living chimpanzee just as from the Australoid we build up a picture of the prototype of living races of Man.

Now we may regard this Prototroglodyte stage in the evolution of the higher primates as the most critical phase in the history of the highest primates. Size and posture of



THE GORILLA'S NORMAL MODE OF PROGRESSION

Unlike Man, the gorilla does not usually walk erect, but is inclined forward at an angle of about forty-five degrees, using arms as well as legs for support. The arms, however, are auxiliary, since it is the legs that carry most of the weight. The profile (above) shows the crest of the highland gorilla.

Photos, Carl Akey and T. Alexander Barns

body had been already attained, but as evolution proceeded we must suppose that new modes of progression became differentiated. In one branch, now represented only by the orang, the upper limbs became more important than the lower limbs in supporting the body while climbing, the result being that the members of this branch became fitted for a purely arboreal existence. In another branch, exemplified by the gorilla, the lower limbs assumed a more important rôle, thus making possible a semi-terrestrial mode of life.

Seeing that the mode of progression was in a state of flux during the evolution of this Prototroglodyte stock it needs no great effort of imagination to suppose that it gave rise to a third divergent branch—one in which the lower limbs became ultimately the sole organs of support and of progression. The prize that awaited the anthropoid stock which made this departure was very great; it would then be no longer confined to the jungle, but could wander abroad and

seek a livelihood in any part of the world. Arms and hands were set at liberty to become the servants of the brain.

It was apparently in such a manner that anthropoid and Man, in their lines of descent, parted company. From this remote Prototroglodyte ancestry Man and the great anthropoids have derived their heavy bodies, their prolonged terms of infancy and life, their upright posture, their common pattern of brain and the basal elements of their structure.

We have thus traced Man's origin back to an anthropoidal stage, and in the minds of those who have read this epitome of history there must have

Different fates of arisen doubts and ques-
Man and Gorilla tions. Why, for example, have the fates of the gorilla and Man been so different? The gorilla, although it has long adopted a form of ground life, has made no advance towards Man's mode of progression; his brain, although bigger than that of the chimpanzee and orang, seems to work less efficiently than theirs.

We obtain some light on these problems when we contrast the evolutionary fate of the gorilla with that of its cousin—the chimpanzee. In many parts of their anatomy they are almost alike; indeed, even those who have some knowledge of African anthropoids may mistake the one for the other. At birth the chimpanzee and the gorilla are of about the same size, both being slightly smaller than human babies. Their bones and muscles are then equally developed; the skulls of both are rounded, smooth, and free from bony crests. As the gorilla approaches adolescence, particularly in the male sex, its muscles become enormously big and strong; great bony crests are thrown out on the skull to strengthen it and give attachment to powerful chewing muscles; the jaws become huge, the chest enlarges and encloses voluminous lungs; the viscera become capacious; in short, the male gorilla grows into a veritable giant.

In the chimpanzee, especially in those of the female sex, we see an opposite tendency at work—a tendency to retain in its skull and body the characters of youth. Growth of muscle, bone and cranial crests is restrained. We see the same

tendency in traits of the chimpanzee's mind; while it retains the playfulness and nimbleness of youth, the gorilla, at no time a merry being, becomes more and more morose and fierce. In these two allied anthropoids we see at work contrasted evolutionary tendencies.

In recent years biologists have succeeded in throwing light on this problem. They have discovered that there is an elaborate machinery in the body for regulating its growth. A part of this machinery is centred in a small gland placed in the floor of the skull under the brain, and known to anatomists as the pituitary gland.

Everyone knows how fertilisers cause plants to grow rapidly; the pituitary continually produces and throws into the blood during the period of growth minute quantities of certain substances which are known as hormones. Hormones are not fertilisers—they act in quite another way—yet in their effects they resemble fertilisers in that they stimulate growth.

It occasionally happens in human beings that the pituitary gland becomes greatly enlarged. If this occurs in a youth then rapid growth sets in and he becomes a giant; if, on the other hand, the enlargement of the pituitary takes place in adult life, people thus afflicted become the sub-
jects of a growth disorder known to medical men as

Machinery of
Evolution

'acromegaly,' or enlargement of the extremities. In subjects of this disorder the hands and feet become enlarged, the jaws and face grow, and as they grow become deformed; the eyebrow ridges become prominent, the muscles of mastication hypertrophy, all the bones and muscles of the body become of abnormal size, the chest expands greatly, the viscera become big, the skin thickens and the hair of the head and of the beard turns coarse.

In brief, we see taking place in acromegalic men and women the same kind of changes which occur normally in adolescent male gorillas. We know that these changes in the human body are associated with an enlargement of the pituitary gland, and we therefore infer that a pituitary influence produces the peculiar characteristics of the gorilla. A diminution of



SKULL OF AN APE ONCE THOUGHT TO BE MAN'S ANCESTOR

It has been claimed that the Taungs ape was a progenitor of Man. Since, however, it was discovered in Pleistocene deposits, it probably dates from this period, during which Man was already existing (see diagram in page 185). Human characteristics in the Taungs skull, such as the absence of protruding bone formations, are largely due to the youth of this particular specimen.

Photos by Prof. Dart, Johannesburg

this influence will retard growth and tend to perpetuate the characters of youth. The pituitary gland may be partly destroyed by disease during youth; the boys or girls in which this occurs grow into fragile, slim dwarfs.

When we compare modern man with the modern gorilla we see that evolution has worked in opposite directions. The gorilla has moved in the direction of brawn; he trusts to sheer brute strength to procure him a livelihood and to secure his safety. Man in his evolutionary career has moved towards brain; he trusts to his wits both for his livelihood and for his defence.

Mention has been made of the tendency in the chimpanzee, as compared with the gorilla, to retain the characters of youth. In the evolution of Man this tendency has become increasingly dominant; modern man carries into his adult years conditions of body, face and skull which belonged only to the youth of his distant ancestors.

More and more he tends to shed the marks of the ape. In Neanderthal man and in Piltdown man we still find massive jaws, simian eyebrow ridges, retreating chins, thick strong skulls. Modern man

has lost most of these traits; they have disappeared and Man has become more a child in body and less a child in mind.

Our knowledge of the machinery which regulates the growth of the body is but in its infancy; the more we come to know of it the more complex and intricate it is seen to be. But it is clear that when biologists have mastered the secret of growth, the problems of human evolution will no longer present the difficulties they now do. The biologist of the future will explain fully and explicitly how Man has come by his gifts of mind and the gorilla by his strength of body.

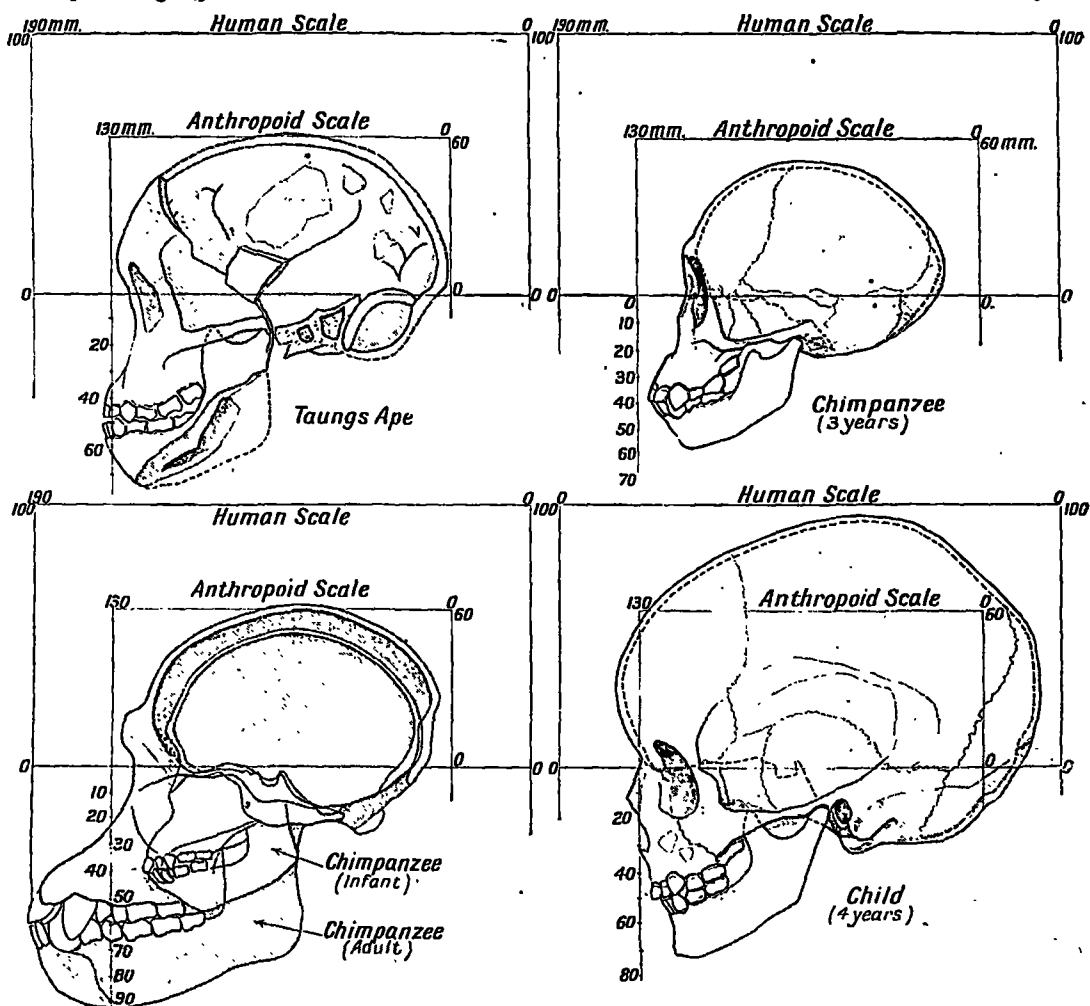
Early in 1925 Professor R. Dart, of Johannesburg, announced the discovery of a fossil skull of an anthropoid ape. To this extinct species of ape he gave the name 'Australopithecus,' claiming for it a special place among Man's ancestors. Unlike all previous discoveries of anthropoid remains, which have yielded only fragments of jaws or isolated bones, the skull described by Professor Dart was almost complete, its interior being filled with a deposit of limestone, and a natural cast of the brain cavity thus preserved.

The state of the teeth and of the sutures showed that the skull was that of a young

anthropoid. It was in a stage of growth which is reached by chimpanzees and gorillas towards the end of their fourth year when they are still in childhood. In characters of teeth, jaws, face and cranial cavity the Taungs anthropoid presents a blend seen in gorillas and chimpanzees of a corresponding age, and yet, in other features, it differs from both, and in the prominence of the forehead and the smallness of jaw makes an approach to young humanity. In these respects it retains the characters of childhood to a greater degree than either the young gorilla or chimpanzee, but in actual size of brain it falls below the standard gorilla at the corresponding age.

When, however, the unerupted molar teeth are examined it is seen that they are larger than those of the chimpanzee but smaller than the corresponding teeth of the gorilla. The size of the unerupted teeth gives a true indication of the size to which the jaws must grow when the animal becomes adult. We may be certain, then, that when the adult skull of this anthropoid eventually comes to light the facial development will prove to be greater than that of the chimpanzee but smaller than that of the gorilla.

From the facts outlined in this account of Man's evolution it will be apparent that if *Australopithecus* is to be accepted as a link in the chain of Man's ancestry, it



TAUNGS APE, CHIMPANZEE AND HUMAN CHILD: THEIR SKULLS COMPARED

In certain features, as, for instance, the prominent forehead, the skull of the three-years-old Taungs ape discovered in South Africa in 1925 approaches that of a human child, but on the whole it more closely resembles the skulls of young chimpanzees, as the above diagrams, prepared by Sir Arthur Keith, show. The adult Taungs ape, therefore, was probably not unlike an adult chimpanzee, but would have certain gorilla-like characteristics; in point of size it was half-way between them.

must have claims to a respectable antiquity, one which will carry it back at least to Miocene times. The skull was found in a limestone quarry near Taungs, a village and district in British Bechuanaland, near the western frontier of the Orange Free State and 80 miles to the north of Kimberley. As the limestone cliffs at Taungs are quarried, old caves which have become filled up are exposed; in the limestone of the caves are found many fossil bones and skulls.

Amongst these are the skulls of baboons which differ only to a slight extent from species now living in South Africa. All the evidence at our disposal points to these caves as having been filled up during Pleistocene times—perhaps in early Pleistocene times—at a period when we know that human beings had already come into existence. *Australopithecus* thus appears too late in the geological record to play a part in Man's ancestry. Had the progeny of *Australopithecus* come down alive to the present day the writer is confident that they would have been grouped by zoologists with the chimpanzee and gorilla.

In discussing the machinery of evolution and the claims of the Taungs anthropoid to a place in Man's ancestry it has been necessary to break the

Prehuman stages of Evolution thread of this narrative. We have traced Man's history backwards until it has mingled with that of anthropoid apes; for the *Prototroglodyte*, which has been postulated in early Miocene times to serve as an ancestor for Man and the chimpanzee, was an anthropoid ape in brain as well as in body.

It is difficult to conceive a world destitute of humanity, and yet on the evidence of geology and of comparative anatomy we are compelled to infer that in an early phase of the Miocene Period, about a million of years distant as time is reckoned here, the highest primate had not risen above the status of an anthropoid. It may therefore seem to the reader that we have now reached the beginning of Man's history and that it is unnecessary to proceed further, as our narrative will be concerned merely with the evolution of anthropoids. We must, however, continue

our enquiry for a reason which can best be exemplified by an instance chosen from another branch of knowledge.

The history of the United States begins with the Declaration of Independence in 1776, but if the historian wishes to explain the origin of the language, literature, customs and institutions of that great democracy he has to study the history of the older parent country. The historian of the human body finds himself in the same case; to discover the beginnings of some of Man's most fundamental characters he has to go back to early stages of anthropoid evolution.

In the forests of further India and throughout those of the larger islands of the Malay Archipelago there still exist the representatives of an ancient family of anthropoid apes—one which bridges the gap, which separates the great anthropoids from the larger monkeys. The small-anthropoid or gibbon family is broken up into about twelve distinct races or species, each confined to some particular region or country. They live in groups or families, each family numbering from ten to twenty members.

The coming of the Gibbons

Gibbons have a firmer hold on life than the great anthropoids and far outnumber them; a low estimate places the total gibbon population at 50,000. They are of small size, weighing about fifteen pounds, approximately the same weight as the commoner monkeys but only about a tenth of the mass attained by great anthropoids. They are purely arboreal in their habits, being the most agile and acrobatic of all living primates. When climbing they hold their bodies in an erect or orthograde posture, using their arms more than their legs to swing from branch to branch and from tree to tree. Every bone and muscle in their bodies has become shaped and arranged to fit them for the orthograde posture.

Unlike the great anthropoids they sleep in a sitting posture, resting on the callosities of their hinder quarters as do the monkeys of the Old World. They are the most shy, timid and gentle of animals, although of unstable temper, not easily tamed and refractory in the hands of the

trainer. Their brain measures about 100 cubic centimetres, one-fourth of that usually found in chimpanzees, but above the capacity of larger monkeys. The convolutionary pattern of the brain is simple, bearing many resemblances to that of the higher monkeys of the Old World and yet distinctly foreshadowing the more complex cerebral pattern of the great anthropoids.

When we set out to discover the ancestral type of the chimpanzee—or, what is more to our present purpose, the origin of the

Ancestral type of Chimpanzee Miocene *Prototroglodyte* from which Man and the great anthropoids have been evolved—the family

of gibbons affords the best guidance. The smaller size of the gibbon and the simplicity of its brain tell us that we have in this living small anthropoid an ancient and primitive type; such an inference is supported by the geological record, for we find its fossil traces in Miocene deposits.

In a thousand structural details its body is modified for the orthograde posture just as are the bodies of the great anthropoids and Man: seeing how much gibbon and great anthropoids resemble one another in the basal elements of their structure we must infer that both types—small anthropoids and great—have inherited the orthograde posture from a common ancestor. This ancestor must have been a small and primitive form of gibbon. It is of especial interest to note that among living gibbons there is one larger species—the siamang—which stands to the ordinary gibbon in much the same relation as the gorilla to the chimpanzee.

This assures us of a tendency in the gibbon family to produce larger varieties. It was an evolutionary movement in the same direction of size which brought the large anthropoid type out of a small and primitive type of gibbon in pre-Miocene times.

We have followed the anthropoid lineage back to a small orthograde primate, closer in structure to the living gibbon than to any other primate known to us. The nearest approach to such a type is made by *Propliopithecus* found in Egyptian strata of early Oligocene age. We know

only the jaws and teeth of this small fossil ape; we do not know its habits of body because we have found no limb bone to guide us. Here, however, where geological records fail us, the evidence of comparative anatomy comes to our aid.

When we contrast the structure of the gibbon with that of the monkeys of the Old World (the Catarrhine family) on the one hand and with that of the New World monkeys (the Platyrrhine family) on the other, we find that they have very many characters in common, and hence we must infer that all of them have arisen from a common stock—a small and primitive form of monkey. The posture of the body amongst the earliest known fossil primates was the pronograde or dog-like posture—still retained by ordinary monkeys. As this early monkey-like stock evolved and diverged there appeared in one branch a new mode of climbing—the vertical or orthograde mode.

Thus to obtain the beginnings of Man's posture we have had to trace the history of the higher primates back to earliest Eocene times—across a stretch of time which on the lowest scale of reckoning amounts to two or three millions of years.

Up to this point we have described Man's history as revealed from two sources—geology and comparative anatomy. We now turn to a third and even more important source of information, the developing body of the embryo.

As late as the third week of its formation, the body of a human embryo is only one tenth of an inch in length, and is composed of a substance so soft, transparent and jelly-like that the anatomists who commenced its study

History written
by the Embryo

nearly a century ago despaired of ever finding out its exact structure. In the latter part of the nineteenth century means were found of hardening early embryos, so that they retained their natural form, of cutting them into a continuous series of transparent microscopic sections, of enlarging these sections and reconstructing from them magnified but exact models of complete embryos.

So intensely has the study of embryology been cultivated in recent years, so exact has the art of reconstruction become,

that medical students of to-day have at their disposal a series of models which illustrate every stage through which the human body passes from the time when it emerges from a single microscopic cell—the fertilised ovum, only the 250th part of an inch in diameter—until it appears at birth as a fully developed child, weighing about seven pounds.

As the embryo passes from stage to stage within the womb we say it *develops*; when we trace the progress of the human body from one geological epoch to another, we say it *evolves*. The anatomist has thus at his disposal two texts of man's history—the geological and the embryological, and his business as a historian is to collate these texts and see how far they harmonise.

In its earliest stages of development the human embryo passes through a series of peculiar and complex processes which culminate in the formation of the placenta—the structure which permits the embryo to draw its nourishment from the womb of the mother. Exactly the same processes are passed through by the early embryos of the anthropoid apes—both great and small. These changes occur only in Man and the anthropoids—the group of orthograde primates which, on the evidence of comparative anatomy and geology, we have traced back to a common Eocene ancestor. Thus, a study of human placentation, just as was the case with posture, reveals how closely the lineage of man is bound up with that of the anthropoid ape.

The anthropoid womb is exactly of the same shape as the human organ. The embryos of monkeys, both those of the Old World and of the New, pass through early changes which, although similar in many ways to those seen in human and anthropoid embryos, are yet less specialised and more primitive. Even *Tarsius*, the sole surviving representative of the great family of Tarsioids—small, monkey-like primates which flourished in early Eocene times—is very similar to monkeys in the structure of its placenta. We thus realize how remote is the period which saw the first steps in the evolution of the human placenta.

All the orthograde primates—Man, gorilla, chimpanzee, orang and gibbon—

are destitute of an external tail, but all of them possess a coccyx, which represents the submerged basal vertebrae of this organ. Every human embryo in the sixth week of development has a true external tail, made up of ten or twelve joints; in the seventh week the tail ceases to grow, and in the eighth week sinks into the rump, leaving at the point of submergence a



SMALLEST OF THE ANTHROPOIDS

The gibbon forms a link in the evolutionary chain that connects Man with the monkeys. It has a small brain, and lives in the tree-tops, an existence for which its limbs are suited.

Photo, Gambier Bolton

dimple which can still be traced in every child at birth. Children are sometimes born with a tail, which may be four inches in length and may be used as an organ of expression when the child sucks.

The embryos of anthropoid apes also pass through a tailed stage. With the evolution of the orthograde posture which, as we have reason to believe, came into being in the Eocene period, the tail disappeared. The presence of an external tail in embryological stages of orthograde

primates signifies that they have arisen from a pronograde or monkey-like ancestor.

In their earlier stages of development the brains of the higher primates—in which group Man is included—are very similar. Even as late as the fourth month of life within the womb, the human brain and that of the great anthropoids scarcely differ from each other in size and shape. In the later months of foetal life the same fissures and convolutions begin to appear in all of them, but while fissures and convolutions remain comparatively simple in the anthropoid brain, they become more numerous and elaborate in Man's.

The volume of brain in a newly born child is about 300 cubic centimetres; in the young of great anthropoids this varies from 200 to 250;

The evidence of the Brain in the gibbon baby the brain volume is only about 70 cubic centimetres.

After birth the brain of the young gibbon increases gradually until the animal is fully grown—a point reached in the seventh year—when the brain has attained about 100 cubic centimetres, thus having added 30 per cent. to the volume present at birth. In the great anthropoid the brain grows rapidly during its first year, attaining 70 per cent. of its full volume. After then it grows slowly, having attained full size—about 450 cubic centimetres—in the twelfth year, when the animal has reached adult age.

In the human brain growth becomes intensified and prolonged. The first three years sees a child's brain expand from 300 to 1,000 cubic centimetres, an addition of 700; growth then slackens, the full size—1450–1500 cubic centimetres—being gradually reached about the twentieth year. The newly born anthropoid with a brain volume of 250 cubic centimetres has, at the end of the third year, an addition of only 100, as compared with the 700 added to a child's brain in a corresponding period. The facts elicited by this comparison will again bring home to the reader that the essential problem of Man's evolution lies in the secrets of brain growth.

We cannot suppose that the great anthropoid attained a brain so superior

in mass to that of his ancestor, the small anthropoid, because he used it more. Nor from what we know of savage races of mankind can we suppose that our remote ancestors came by their large brains because they applied them to more difficult tasks than did the great anthropoids. We must remember that an increase of brain in recent geological periods is not confined to the higher primates. As Sir E. Ray Lankester has pointed out, the horse, rhinoceros, elephant, ox, pig and lion of to-day are much larger brained than were their representatives of the Eocene period. The Tertiary period has been one of general cerebral progress.

If in recent geological periods the human body has ascended through a graduated series of forms to its present condition, why is it that we see no trace of these stages during the later months of its growth within the womb? We cannot say that in any particular month the human foetus resembles a monkey, then a small anthropoid and then a large anthropoid. Nor, if we go to earlier stages of development, can we recognize any which correspond to invertebrate, vertebrate, fish-like, reptilian or mammalian phases of evolution.

In a clear and diagrammatic way the human embryo does not recapitulate the chapters of its history. Nor need we wonder at this when we note how evolution works **What the Embryo can teach**

a city palace and a turf-roofed hovel every intermediate stage can be observed; the palace has evolved from the hovel. Yet when a builder begins to erect a palace should we not think him foolish were he to put up a hovel on the site and then proceed to enlarge it, stage by stage, until a palace finally emerged?

Yet amidst all the confusion we can still recognize definite traces of Man's evolutionary history. His body springs from a single cell; as that cell divides and re-divides until a cluster is formed, certain transformations take place which are almost identical with those seen in developing lower invertebrate animals.

In the second month of its formation the human embryo possesses a series of

gill-like arches in its neck. The upper lip at the same period has a double cleft as in a dog-fish; children who are born with a double hare-lip thus reproduce a feature of a fish-like ancestor. Until it enters the third month a foetus has no palate or roof to its mouth. In this respect it is then like a reptile. Children born with a cleft palate retain a reptilian character. Scores of such instances could be cited. We cannot explain the elaborate processes of development which raise the human body from a single cell, unless we accept evolution as a truth; and yet there is no orderly recapitulation of evolutionary stages.

In another part of this chapter mention has been made of Man having come by many of his modern features—features of face and skull—by retaining to adult years characters which appeared in primitive man only in childhood or in youth. It is in this manner that Man has come by many of his most characteristic features of body and of mind.

We need only cite a few instances. The bodies of all anthropoids are covered with hair; in Man alone has the body become nude—only his scalp remains covered. When, however, we examine in the womb the body of a foetal chimpanzee a month before it is born, we

find that, as regards hair distribution, it resembles exactly a human foetus at the same stage of life;

in both the scalp is covered with hair, while the body appears nude, although it is really covered by fine hairs or lanugo. By the time of birth the chimpanzee is hairy all over, but the human baby retains the foetal state. Thus Man has come by his nude body in retaining to adult years a stage which occurs in the foetal life of great anthropoids. A nude skin was possible in foetal stages of development because in the shelter of the womb mammals require no covering to maintain their warmth.

Another instance may be cited in connexion with the skin. Pigment does not begin to form in the skin of anthropoid apes until the later months of foetal life. At the eighth month a foetal chimpanzee is still of a light grey colour; the negro

baby at birth is only a light chocolate; still earlier, at the fifth month, the chimpanzee foetus is only slightly darker than a foetus of European parentage. The white man has acquired his fair skin by retaining the almost unpigmented skin of the early anthropoid foetus. In dark races of mankind it is the subsequent pigmentation that is retained.

In 1904 Professor G. H. F. Nuttall, of Cambridge University, refined a method of determining the degree of relationship between animals in a new

way, one founded on certain reactions given by blood. His observations

New test of blood affinity

confirmed the opinion which anatomists had formed concerning the exceedingly close evolutionary relationship between the great anthropoids and Man. Professor Nuttall found that the blood of great anthropoids gave almost the same reaction as that of Man, while the blood of Old World monkeys responded to a less degree, and that of New World monkeys still less.

The test of disease leads to a similar conclusion. Man is highly susceptible to the virus of syphilis; the chimpanzee is also susceptible but to a lesser degree, while Old World monkeys are inoculated with difficulty. Anthropoids, like Man, have a vermiform appendix; when kept in captivity and fed on a human dietary the chimpanzee occasionally becomes the subject of appendicitis. When the evidence from all these lines of enquiry is taken into consideration the anatomist's verdict, that Man and ape are akin, cannot be denied.

In the various sections of this chapter evidence relating to Man's history has been drawn from three sources—from Geology, Comparative Anatomy and Embryology. In each case it has been necessary to begin with Man as he exists in the modern world and then, by following his evolutionary trail, to carry history, stage upon stage, into a remote past. We have been reading Man's history backwards.

But now, having assembled our documents and established a scale of chronology—one which, we admit, is merely provisional—we may adopt the method of orthodox historians and trace Man's

history down the stream of time. This can best be done by means of a diagram, such as is shown in the opposite page, which in reality represents Man's family tree. In that diagram the geological formations laid down in the Tertiary and Quaternary Eras of the Earth's history—Eocene, Oligocene, Miocene, Pliocene, Pleistocene and Recent—have been heaped one upon the other in order to form a chronological background; the depth or thickness given to each formation represents a relative estimate of the total time taken for its deposition.

Human history begins long before Man became a separate entity; it really takes its origin in the Eocene Period when a stock of small primitive monkeys or Tarsioids began to diverge into three groups. Two of these continued to evolve along quadrumanal or four-handed lines, retaining a pronograde posture of body, while the third evolved in a new direction, becoming adapted to an upright or orthograde posture. It is this early orthograde stock alone which concerns us.

In the lower or older part of the Oligocene we meet with fossil remains of a member of this stock, *Propliopithecus*. Then from this point of time until the middle of the Miocene there is a great blank in our geological records, but from the evidence of comparative anatomy it is possible to sketch in the missing lines of descent. In the Oligocene Period the early Orthograde primates grew bigger in body and in brain, until they became, in these respects, almost equal to the small anthropoids of to-day—the gibbons.

Very soon in the Oligocene this small anthropoid stock again broke up; one branch retained the characters of the ancient stock descending through the ages, altered only in a multitude of minor characters, and have become the gibbons of the modern world. Another branch of the small Oligocene anthropoids gained greatly in mass of body and size of brain, and thus the great anthropoid stock came into existence. The appearance of this new stock brings the historian appreciably nearer to his goal—the point at which Man's stock came by a separate existence.

For reasons already given, Man's origin has to be sought for in this early great anthropoid stock, and the date of his emergence has to be assigned, on such evidence as is now available, to a late point in the Oligocene Period, or even to the beginning of the Miocene. Fossil remains of great anthropoids become abundant in middle Miocene deposits; this ancient stock, greatly modified in detail, has come down to the present day in the form of gorillas, chimpanzées and orangs, while another branch, that which has given origin to the diverse family of mankind, has, in the same period of time, undergone profound evolutionary changes.

Between the end of the Oligocene Period, where the emergence of Man from the great anthropoid stock is indicated, until the end of the Pliocene Period, when the first sure trace of him occurs—the fossil remains of the Java type—our geological record is a complete blank, but here again anatomical evidence comes to our assistance. Java man has retained many marks of a simian origin, but his brain was on the threshold of humanity and he was altogether a man in posture and gait. Thus, although Man had apparently begun his emergence by the beginning of the Miocene Period, it took him two long geological periods, 600,000 years or more, to reach a stage which may be called human only by courtesy.

The early stages in Man's evolution were slow and prolonged. Even when we enter the Pleistocene—the beginning of the human or Quaternary phase of the Earth's history—we find that the human family, while broken up into such divergent types as are represented by Piltdown man, Heidelberg man and Neanderthal man, retains primitive ape-like features throughout, although the brain had gained greatly in mass and in power. It is true that these have all become extinct and been replaced by human races of the modern or Neanthropic type.

Where the ancestry of modern races parted company from that of the extinct types just mentioned, we cannot yet tell; the degree of divergence between the Neanthropic races of mankind inclines

Construction of
Man's pedigree

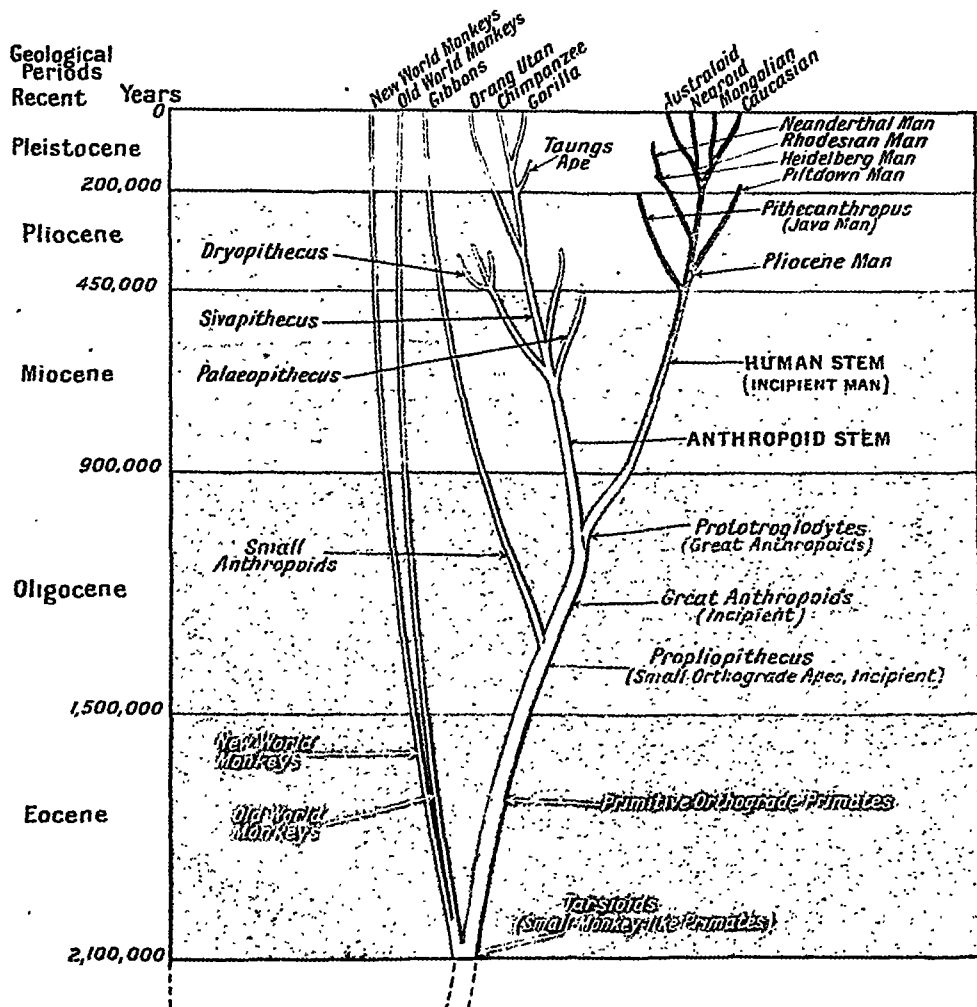
Man's long
upward struggle

anthropologists to look for their common ancestral stock amongst early Pleistocene forms, but the only fossil type, so far discovered, which could have served as an ancestor is Rhodesian man. We cannot place this type at a much earlier date than the middle of the Pleistocene period, and in size of brain and in massiveness of jaw and skull Rhodesian man was more primitive—more gorilla-like—than the lowest of living human races.

Thus all lines of evidence lead to the conclusion that Man is the most recently evolved and the most profoundly changed

of all living primates. Less than a million of years have elapsed since his emergence began; it was not until the beginning of the Pleistocene period—some 200,000 years ago—that his brain reached a low human level.

When we consider how recently Man has come by his present estate, the rapidity of his evolution, the mushroom-like growth of modern civilization, the pushfulness of his progress, the ever accelerating rate at which he changes his conditions of life, our hopes for his future are tempered by a certain trepidation.



THE COMMON GENEALOGICAL TREE OF MANKIND, ANTHROPOIDS AND MONKEYS

This diagram, prepared by Sir Arthur Keith, gives us an idea of the ages during which Man has been evolving and of his lowly origin. It will be seen how early the branches of the apes and the monkeys, springing from a common trunk, became differentiated, and how the former in turn split into the anthropoid and the human stems. The way in which some species of Man, such as the Java, Pitdown and Neanderthal, have become extinct is also clearly indicated.



THE ICE AGE IN SWITZERLAND TO-DAY : VIEW OF THE GORNER GLACIER FLOWING FROM THE SLOPES OF MONTE ROSA

Were the average temperature over Europe to drop by as little as 8°F. , it is calculated that glaciers such as this would be spreading down the flanks of the mountains even in the British Isles, and that the whole land would be in the grip of an Arctic climate. Similar conditions attended the most pregnant epoch in human development ; for Neanderthal man weathered the last great advance of the ice (the Würm phase), and probably sharpened his wits by learning to contend successfully with its rigours, while modern man appeared on the scene before the effects of the glaciation had disappeared.

THE PRIMITIVE COMMUNITY & ORIGINS OF RACES

With Inferences as to the Manners and Customs of Pre-historic Man from the Study of Modern 'Primitives'

By H. J. FLEURE D.Sc.

Professor of Geography and Anthropology in the University College of Wales, Aberystwyth; Author of *Peoples of Europe*, *Races of England and Wales*, etc.

THE old theory of the noble savage entering into a social contract is now as obsolete as that of a primeval communism. Society is part of Man's heritage from a pre-human ancestry, and it is within society that human individuality has grown up, providing a leaven of change which has vastly altered, but not constructed, society. Nor have forms of society arisen in each region simply in response to the conditions of life in that region; much depended on the vigour of the human types that reached the region in question, and perhaps still more upon the contacts of each society with others, and especially with those which first developed the great art of food production and its accompanying inventions.

Without trenching on the preceding chapter, we may urge that the human baby is more helpless than his animal cousins, and remains so for a longer time, both because his head is bigger and he needs longer to learn to hold it up, and because his body has only downy hair and so is more delicate. This implies longer and more intimate association between mother and child, and is therefore a stimulus to intercommunication and to development of language, besides giving increased opportunities for education.

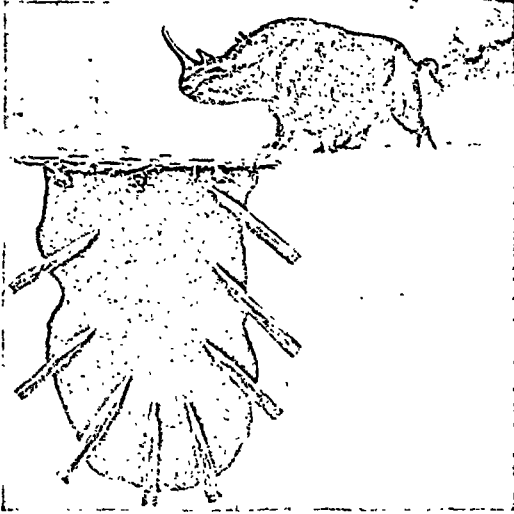
Whereas, in animal groups, the two sexes run together most of the time, in nearly all human societies women's work is differentiated from men's work. Man's animal relatives depend mainly on vegetable food, though they eat flesh on occasion. Man, on the other hand, has long depended largely on flesh and animal products; quite early in his history he became far more of a hunter than his ancestors, and this occurred while woman was becoming more of a nurse.

The data available for picturing the primitive communities of mankind are very scanty, but we may make a rather speculative effort. All the skulls and bones of men of periods before the last great retreat of the ice sheets from the highlands of Europe and central Asia testify to types different from those living in the world to-day. Some observers have called them different species, and efforts have been made to reconstruct their appearance. Some of these efforts have been too much influenced by a desire to emphasise the contrasts between such ancient types and our nobler selves, and the task of reconstructing the physiognomy of extinct types is a difficult and a not very profitable one.

Those known up to the present all had much heavier jaws and larger teeth than we have, and the majority did not as yet walk erect, so we may imagine their heads projecting, with rather broad flat noses and big outstanding mouths (see page 194). *Uncouth mien of Primitive Man* Those who belonged to the Neanderthal race, at least, had great brow-ridges running right across above the nose, and their fore-brains were relatively less developed than ours, while the forehead was correspondingly low. The skull, supposed to be that of a woman, found at Piltdown in Sussex (see page 150) contrasts with those of the Neanderthal race in not having the brow-ridges, so we cannot say that these were prominent in all primitive folk.

The groups were no doubt not very large, for concentration of population would bring risks of starvation among people as yet merely hunting and gathering. It is more than likely, therefore, that the young men and the older ones had

many struggles. On the other hand, it is doubtful whether one man alone would be able to defend his mate, or mates, and children, or would have much success in making pitfalls for great beasts and driving them into the pitfalls; so a few would associate in a group and would attach to themselves a certain number of women and children. We have every reason to



HOW THE PITFALL WAS MADE

Palaeolithic hunters, we may assume, associated themselves into bands for the purpose of driving into pitfalls, such as this, the beasts that then roamed Europe. The pitfall, furnished with wooden stakes, has modern parallels in East Africa.

suspect that the aged, no longer able to hunt effectively, would get little consideration and might be abandoned or killed. Against this is to be set the probability that women were already performing their outstanding function, in Tennyson's words, as 'a link among the days to knit the generations each with each.'

Though the group probably included a few men and some women and their children, it should not be lightly supposed that there must have been sexual promiscuity. However little paternity was understood, some sense of rights and privileges was almost certainly in men's minds, though it would be hazardous to say that either monogamy or polygyny was a general rule. Probably both occurred, and there may have been cases of sexual communism as well.

The men hunted, the women and children gathered nuts and roots and berries and small animals; and we may imagine

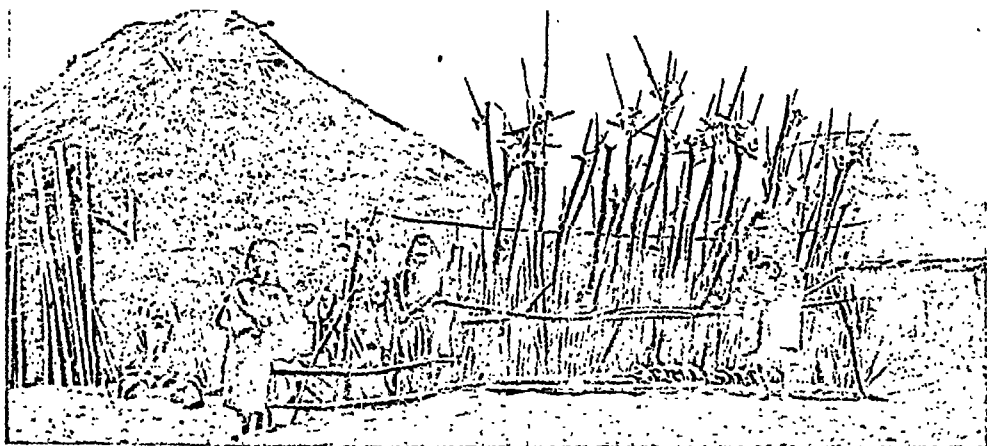
the tired and often unsuccessful hunters coming back to their womenfolk and making the best of a meal of blackberries, or beetles, or mice, or perhaps tough roots hammered in water to make them a little less forbidding. Early man was already, no doubt, a groundling, living on the grasslands, but probably not far from the forest edge; and though there must have been many groups that broke up because the men or the women lost their way, we can picture them calling to one another and acquiring the habit of making special sounds that became their personal names, or others that came to signify the food they had found or the dangers in the way. Their rudimentary languages must have been diverse and rather inconstant."

Somehow they learned about fire; very likely at first only how to enjoy it, then how to keep it going, and only after much experience how to make it. The first acquisition of fire is easy to imagine, as so many prairie and forest fires occur without Man's intervention. We may think of the women and children tending the fire and finding comfort therein, especially during the chill winters; and wherever their women waited with fire and some sort of food, thither the hunters would return sooner or later, with or without their booty.

The fire was a social centre, a promoter of intercourse and of language, a defence against wild beasts and a help to the women in the rearing of their babies. Who knows how early in cool regions the woman-guardian of the social fire may not have become a feature of group life, a far-off precursor of the Vestals of Roman history?

When the hunters had luck, there was work to do around the home-fire. In Chapter 6 there is a picture of our forefathers first appreciating, then selecting, then adapting and finally inventing implements. One of the earliest uses of implements was probably for dealing with the produce of the chase, for skinning the big beasts, and most likely for chopping up their flesh, often eaten half raw and more than usually tough if one was too hungry to wait till it was softened by turning 'high.' They had doubtless long appreciated

Society begins
at the Fireside



MODERN PARALLEL TO PREHISTORIC BELIEF : BEAR-SKULLS PROTECT VILLAGE

Modern Ainu of Sakhalien Island furnish an interesting parallel to Mousterian beliefs about the bear. These folk, themselves the survivors of a very ancient strain, imagining the bear to be the seat of strength and courage, not only hunt it in the ordinary way, but also rear bears from infancy, sacrifice and feast on them when full grown, and keep the skulls on poles round their houses.

Courtesy of John F. Rehill

stones as missiles to drive off wild beasts and rivals, they had seen the fracture of flint and learned to know that most fundamental of the precious stones, and they had thus learned what a sharp edge a fractured flint could have.

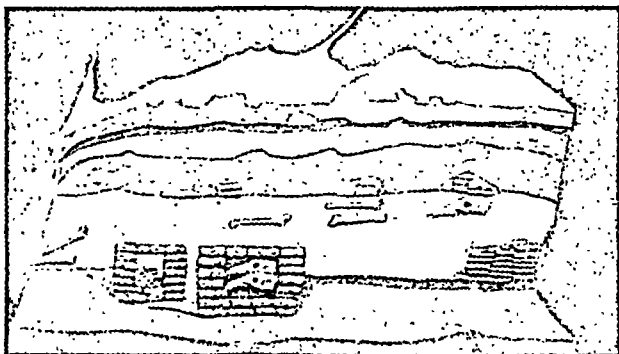
The men, tired of the hunt, must often have left the skinning to the women, who found the skins precious shelters for their babies and themselves from the cold night winds; and clothing grew in part from this experience.

The deliberate chipping of flint was a clear step forward, and the types of implements in early days seem to have been comparatively few and surprisingly constant over a long range in time and space. This statement needs some qualification, for, while the 'bouchers' or coups-de-poing called Chellean and Acheulean are characteristic for western Europe and several other regions, there were in central Europe contemporary implements, made from flakes rather than from cores, called pre-Mousterian.

The constancy of types reminds us that education was developing, but that the heavy hand of custom lay upon it:

initiative was as yet weak. Nevertheless, many of the implements of the early Palaeolithic are splendid examples of workmanship and reveal a feeling for symmetry and beauty; there had begun to be an outlet for individuality in the pursuit of the craftsman's joy.

While our early social group, then, largely followed immemorial custom, it was also beginning to enlarge the scope of individuality, and we must picture the gradual replacement of the simple repetition of customary acts by an increase of thought, leading to action based on recognition of mutual obligations.



BEAR-CULTS AMONG PRIMITIVE MEN?

This diagrammatic cross-section of the Drachenloch, a cave near the summit of the Drachenberg in St. Gallen, Switzerland, shows how early Mousterian man set aside the skulls of the cave-bear in neat stone cists, possibly for 'religious' purposes.

After Bachler



EARLY AND MOST FORMIDABLE COMPETITOR OF MAN THE HUNTER

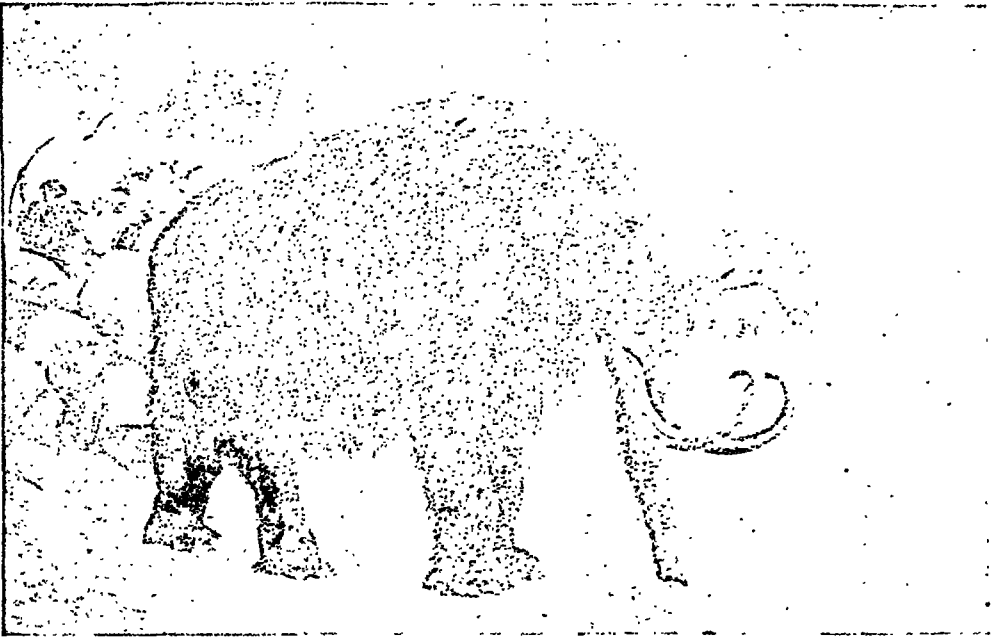
Beasts more terrifying than the bear also occupied the attention of early man. These varied greatly with the slow march of the centuries, according as the glaciers made Europe an Arctic steppe or, retreating, allowed the spread of the forests. Great sabre-toothed cats early became extinct, and, if they encountered pre-Chellean man, must have been hunters rather than hunted.



CREATURE THAT ALONG WITH MAN RESISTED THE RIGOURS OF THE ICE

Sabre-toothed cats, though tiger-like in many respects, were really a species that is quite extinct; but some of the animals which were hunted during the periods of glaciation were very like existing types, slightly adapted to withstand extreme cold. Such was the woolly rhinoceros, with its coat of thick hair, found faithfully depicted in the caverns of the later Old Stone Age in southern France.

Reconstructions by Charles R. Knight, by courtesy of American Museum of Natural History



MOST SPECIALISED OF THE ELEPHANTS : MAMMOTH OF FROZEN EUROPE

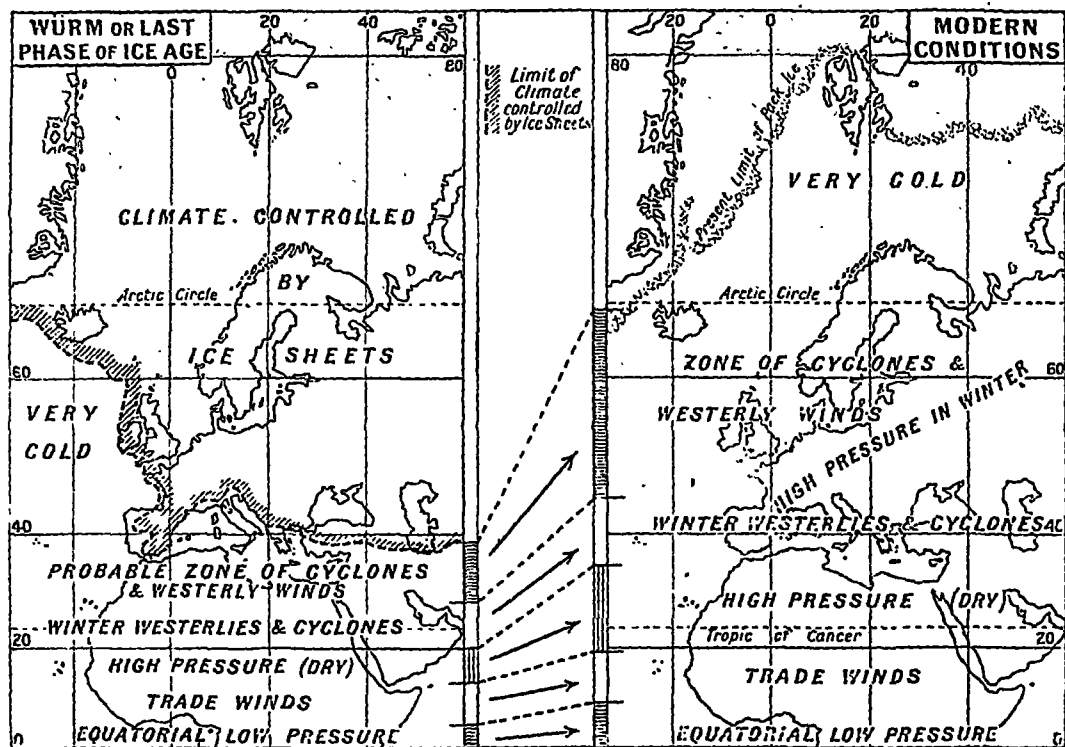
More familiar than the woolly rhinoceros is another beast that made Europe its home in the long ages when the glaciers were grinding down the valleys. This was the mammoth, an elephant which protected itself against the cold with a thick coat of reddish hair through which projected longer and darker hairs (see page 136). Its tusks were peculiarly long and had a pronounced upward curve.

Courtesy of American Museum of Natural History



MAMMOTH CARCASE PRESERVED BY THE COLD THROUGH THOUSANDS OF YEARS

Drawings of the mammoth, as well as of the woolly rhinoceros, are preserved for us on the walls of palaeolithic caves, but we are fortunate in having more conclusive evidence for its appearance. Carcases of these animals have been found in the frozen soil of the Siberian tundra, so fresh that their flesh was still edible ; one of these, from the Beresovka, is mounted in the Leningrad Museum.



HOW THE RETREAT OF THE ICE AGE ALTERED THE CLIMATE OF EUROPE

Some of the movements of prehistoric man, as revealed by the remains of his cultures, have considerable light shed upon them by considerations of climate. Thus, during the last great advance of the ice, it is probable that North Africa and the Sahara enjoyed a type of climate which to-day we associate with central Europe, as shown by these two parallel maps designed by Prof. Fleure.

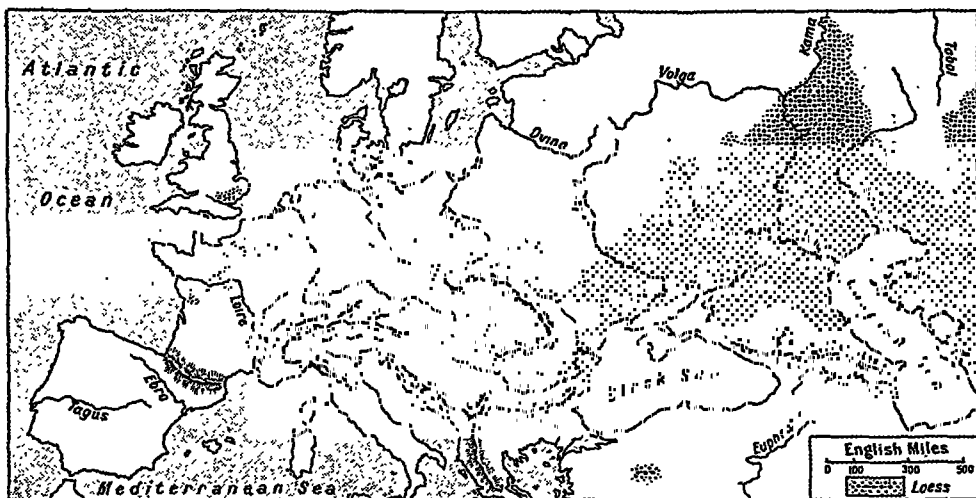
The thoughts of the early hunters were turned towards the problem of securing prey, and from Switzerland and South Germany we have interesting evidence of the working of their minds on this subject in the days of the early Mousterian or pre-Mousterian culture, though we have as yet no indication of the types of men concerned. There, in certain caves, have been found regularly arranged skulls of the cave-bear, in some cases with one of the great limb bones near by. The indications are to the effect that the hunters cut off the bear's head and set it in a special place in the cave, and sometimes also set aside in this fashion a prime joint. In one instance these remains are arranged between the cave wall and a wall built of ordered stone blocks; in another, regular stone blocks are arranged to form a box or cist, with a lid of stone, to contain the remains.

It is difficult to avoid the conclusion that these are offerings, analogous to what in later times would have been called first-fruits; so already in this very early stage of hunting society we are, as it were, on

the threshold of religion. The dating of these finds is perhaps not yet quite finally settled, but they are very old.

Sir James Frazer in *The Golden Bough* gives many instances of ceremonies centring around the bear among the Ainu, who use it for food, while the Gilyaks and Ostiaks are said to celebrate a festival for each bear they kill, and the bear enters into other ceremonies among them.

Already in the Mousterian period ceremonial burial occurred among men of Neanderthal race, and such burials became numerous in the succeeding, or Aurignacian, period among men of modern type, apparently very different from their predecessors in general civilization. Both cultures thus developed this idea, which some associate with the dawn of the dream of immortality, and which may at least indicate fancies about the magical powers of a leader continuing to exert themselves after his death. They also suggest that the glamour of leadership and power was already felt and that emulation, maybe, and the desire for social considera-



A LEGACY OF THE ICE SHEETS TO EUROPEAN GEOGRAPHY

One of the effects of the Ice Age in Europe was the accumulation, along the northern face of the uplands, of wind-borne material from mud dropped by glaciers. Arctic conditions restricted the forests, but even when they began to spread, this soil, called 'loess,' not being suitable for trees, remained as a clear zone permitting migration. The loess in western Europe is of a modified type.

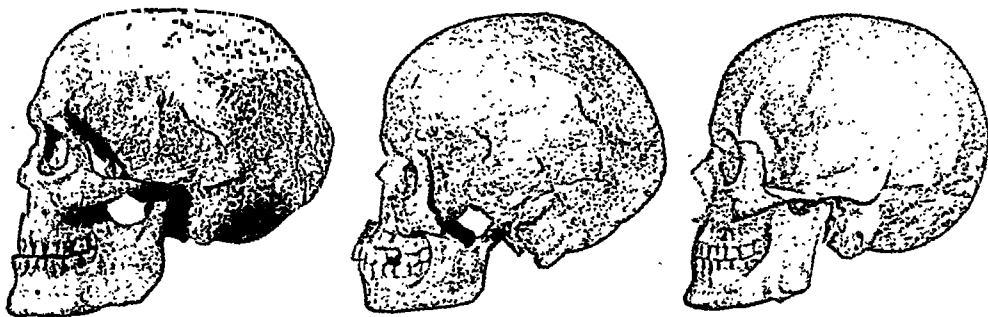
Based on material provided by Prof. H. J. Fleure and Mr. V. Gordon Childs

tion were playing their part in some crude way as factors of social life.

The region inhabited by our earliest forebears who could be called men is a subject of much discussion. Some students think that central Asia before the great mountains arose was the scene of the beginnings of human evolution, but, however this may be, that part of the world was very inhospitable during the successive phases of the Ice Age; and it is with Man in the succession of ice ages and intermediate warmer phases, in the northern hemisphere of the Old World, that we are mainly concerned at the moment. During those intermediate phases men penetrated

into western and central Europe; in the cold phases they seem to have inhabited north and north-east Africa and India.

It is always possible that new evidence may be found to alter this provisional view. Nevertheless the view is of some importance because it suggests movements of men which, at first thought, seem to correspond with the movements of plants and animals, though on further examination we get the impression that this is true only in a broad sense and is subject to reservations due probably to the growing mental powers of Man, powers which enabled him to avoid the previously inexorable alternatives of migration or death. The Neander-



WHY STONE AGE HUNTER-ARTISTS ARE RANKED AMONG MODERN MEN

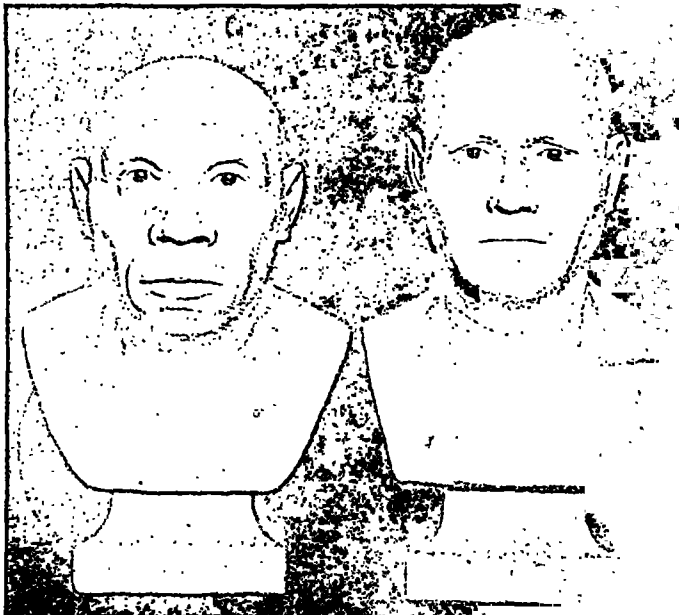
The new races that held the field in Europe after the disappearance of the Neanderthals are considered to be modern men—that is, of the same species as ourselves; indeed their traits may be recognized in some folk to-day. That there is no real difference between them and us is shown by these examples: Cro-Magnon (left) and negroid Grimaldi (centre), compared with a modern skull.

From Dr. R. Verneau, Les Grottes de Grimaldi

that race seems to have been able to withstand the last great phase of ice-spread in Europe, and the Abbé Breuil has suggested that it had lived through the previous glacial maximum as well.

We do not know how it contrived to adapt itself or its equipment to the bitter cold; but, as its flint utensils were made from flakes chipped off blocks, whereas other races of that early time used chiefly the cores left after flakes had been chipped away, we must suppose that there were a good many differences in mode of life between that race and others. It has been suggested that some of its anatomical peculiarities were specialisations of its own, though we cannot yet say that they were the result of life in any particular environment.

Our bodies function best in a cool, temperate, variable climate with a good many storms and occasional, not too long, cold spells.



CONTRAST BETWEEN TWO HUMAN TYPES

It is easier to estimate the resemblance of the European hunter-artists (right) to ourselves if we compare them with their predecessors the Neanderthals (left). For clarity these reconstructions, the manner of whose building-up from the naked skull is shown in page 167, are given in the hairless stage.



NEANDERTHAL AND MODERN PROFILES

These are profile views of the same two heads shown full-face below. Such reconstructions must not be taken in too literal a sense; their chief value lies in showing the degree of difference between the two types, rather than their exact appearance.

Reconstructions in this page copyrighted by Dr. J. H. MacGregor

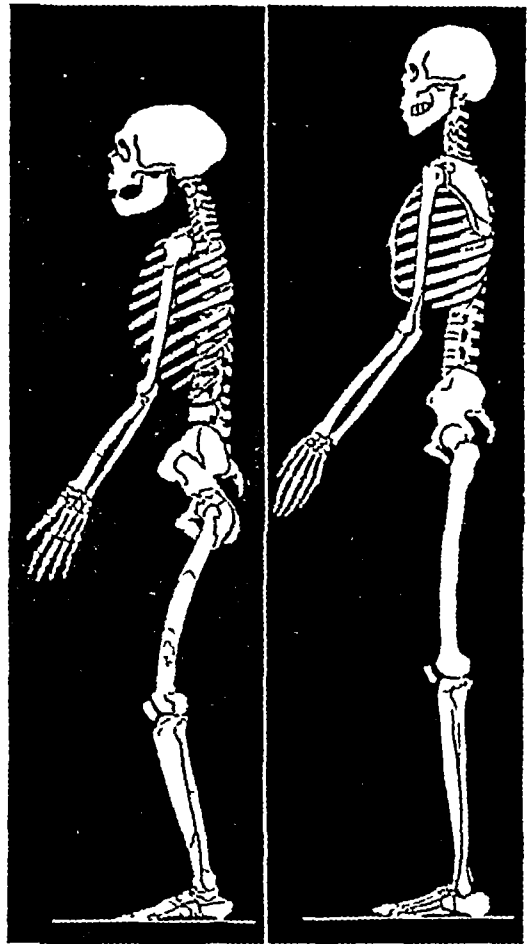
Our minds are said to work best under cooler conditions still. It has thence been argued that the conditions which best suit us are those under which our ancestors became men of modern type, and that they gained an access of mental power in an age of cold. The argument is not a very strong one, but the conclusion is probable enough on other grounds, and it is moreover likely that those who had the initiative to cope with cold conditions, perhaps by means of fire and clothing, gained mentally thereby.

The last glacial maximum, called by Penck the Würm Ice Phase, began to pass away some fifteen or seventeen thousand years ago, though, the retreat of the ice is thought to have been broken by considerable, if occasional, fresh

advances during several thousands of years, the definitive retreat, broken only by short partial returns of cold, is provisionally datable a good deal less than 10,000 years ago (see page 220). When the ice sheets in Europe and central Asia were extensive, the belt over which the westerlies and their cyclones blew from the Atlantic lay correspondingly farther south and the Sahara and Arabia appear to have had winter rain and to have been grasslands. The desert belt, as now, seems to have fringed those grasslands on the south, in Africa.

It is a useful provisional hypothesis that during this cold phase, on these grasslands lying between the Atlantic coast of the Sahara and the mountains of Persia, modern man came into existence, and that he spread thence. He could spread southward and south-eastward quite early, northward he would spread only as climate improved. His southward spread was, at first, through barren country, and was a route that the less fortunate alone would be likely to take. This is a fact that has a large bearing on the development of races and communities in Africa, as we shall see later on.

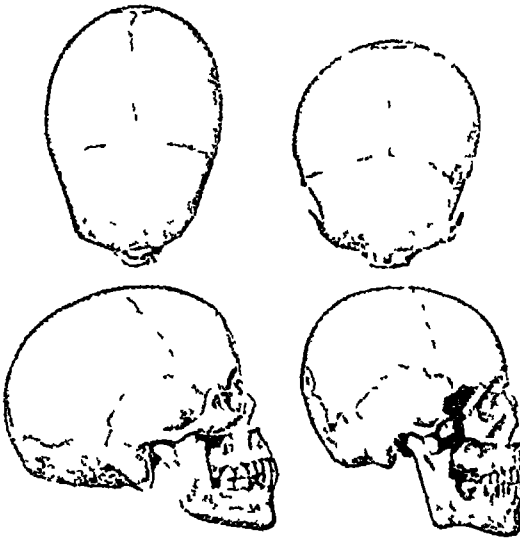
So long as a large amount of ice remained in Europe, the severe climate seems to



NEANDERTHAL AND AUSTRALIAN

A comparison of a complete Neanderthal skeleton (left, restored) with that of a modern Australian shows greater simian affinities in the former. Neanderthal man was much shorter, and his bones were not so well adapted for an upright gait.

From Prof. M. Boule's Fossil Man



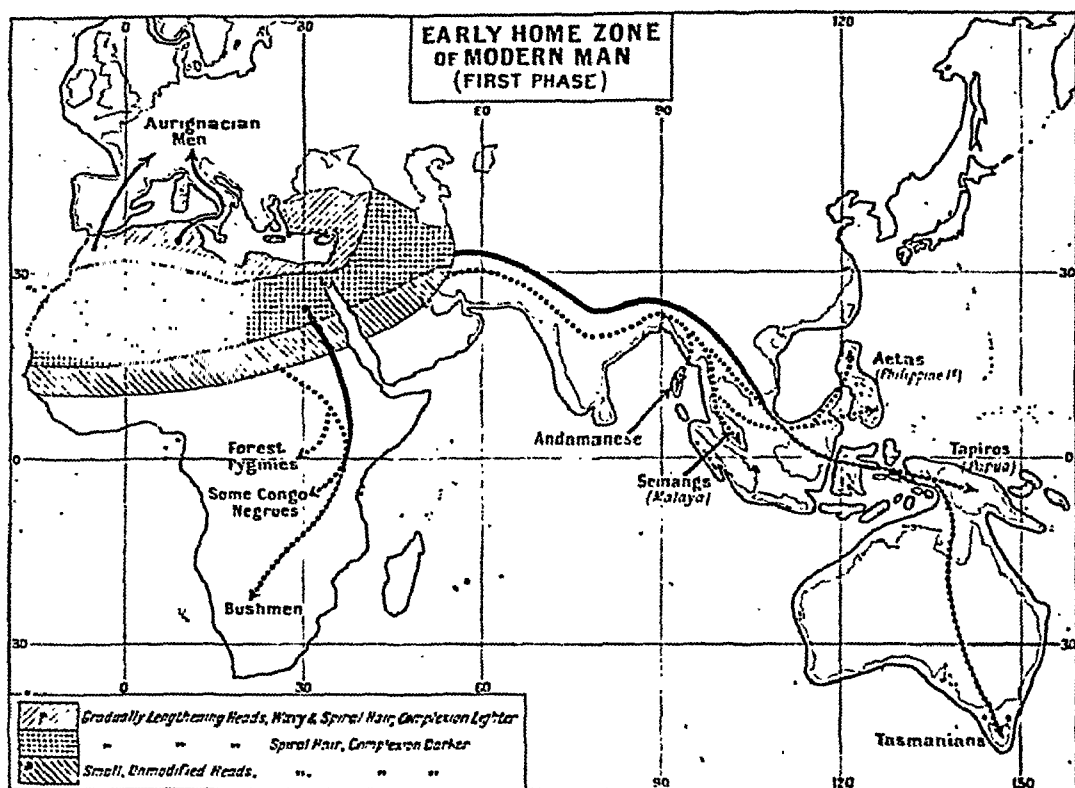
SKULLS LONG AND SHORT

Long headed, or dolichocephalic, types (left) have the skull long from back to front, and rather narrow, while short headed, or brachycephalic, types (right) compensate for the shortness of the skull by added breadth.

From drawings of fossil skulls by Dr. R. Verneau

have kept the land fairly bare of trees. There were apparently great grassy expanses, and the winds from the ice sheets spread fine-grained material from the mud dropped by melting glaciers. This fine-grained material, carried southward by the wind, accumulated to form what is called 'loess' along the northern foot of the hills of central Europe, as well as in a belt across Russia, in Turkestan and on the eastern side of the great central highland of Asia in what is now North China. This loess, fertile yet unsuited for forests, has played an enormous part in the later growth of human societies (see further under Chapters 14 and 30).

Amelioration of climate brought a spring-time in human life, and it is from



WHERE MODERN MAN PROBABLY ORIGINATED AND HOW HE SPREAD

It must be emphasised that this map and its successors are not intended to show what is known to have taken place; they represent a useful hypothesis in the present state of our knowledge. As the grip of the ice loosened on Europe, long headed ancestors of modern men spread into it from the grasslands of Africa, while fringing groups with unmodified heads migrated southward and eastward. Relics of the latter probably remain in pygmy races of Africa and Australasia.

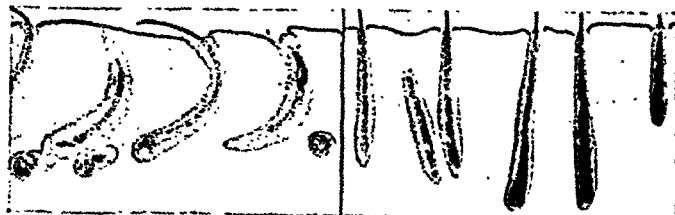
Maps of this and subsequent phases from material supplied by Prof. H. J. Fleure

the Aurignacian period that we have the earliest indications of modern man.

Modern types of Man differ from ancient and extinct types especially in the better development of the fore-brain; and this change, associated with improvement of both eye and hand, as Elliot Smith has explained in his essays on the Evolution of Man, culminated in the origin of modern man probably somewhere on what were then the grasslands between the Atlantic edge of the modern Sahara and the

Persian mountain border of Mesopotamia. For reasons that are discussed in *The Regional Balance of Racial Evolution*, in the 1926 report of the British Association for the Advancement of Science, the space for development of the fore-brain was found mainly by additional growth in the length of the skull, so some of the earliest examples of modern man have extremely long and narrow heads; and they are generally high headed as well.

It is useful, as an hypothesis, to think of this change as occurring, with varying degrees of completeness, among the population of the grasslands mentioned, about the middle of the Old Stone Age or earlier. There were probably individuals, especially on the southern inhospitable desert fringe of the grasslands, in whom little or



USEFUL INDEX OF RACIAL AFFINITY

Spiral hair, with a strap-like cross-section, grows from roots close to the skin (Hottentot, left); while the lank, straight sort, circular in cross-section, grows from deep roots (Javanese).

none of this extra lengthening occurred. They remained small headed, and neither very long nor very round headed. We lack evidence as yet from early skulls for the ancient existence of this small headed type of modern man; but there are small headed types in the modern population of Africa and south-eastern Asia which have many indications that they are survivors of something very early.

They are generally known as the pygmy peoples, and are neither very long headed nor very round headed. They mostly have jaws projecting strongly forward, but weak chins. Those found in south-eastern Asia and the East Indian Archipelago are very dark-skinned; those in Africa are in some cases dark, in others rather light-skinned (a yellowish grey-brown). In all, the adult hair grows from curved roots close to the surface of the skin; the hairs themselves are shaped like curved straps.

The hair of the embryo and the newborn babe is of a downy character and grows from relatively straight roots coming from deeper parts of the skin, like the hair roots of European and Asiatic peoples



A RACE NOW EXTINCT

One of the most primitive types of modern man was no doubt the recently extinct Tasmanian; this old woman with curly hair and broad, flat nose survived to have her photograph taken.

Courtesy of Royal Anthropological Institute

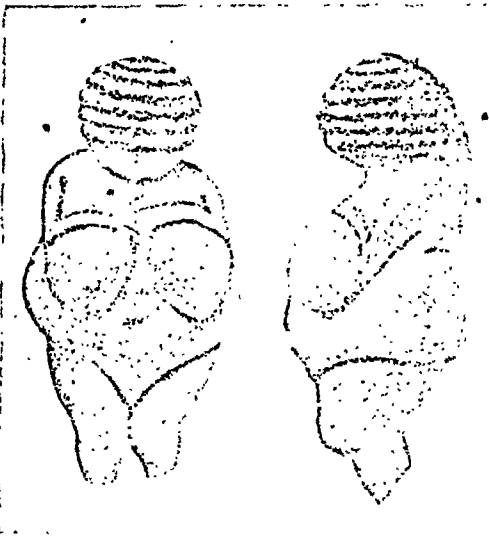
nowadays. It is therefore probable that curved and superficially placed hair roots are a specialisation among types of man on the south side of the early home zone. This specialisation allows the blood vessels



PYGMY SURVIVORS OF VERY EARLY TYPES OF MODERN MAN

Two Tapiros of Papua (top left) are engaged in making fire; in them, as in the Tasmanians, pygmy blood is mixed with a taller and longer headed strain. Purer, and therefore shorter, are the true pygmies of the Congo forests; the head-shape of the Wambut girl (her father wears a head-dress) is shown in the profile view, while on the right they are compared in stature with a European.

Photos of Wambuts by T. Alexander Barns



HAIR IN AURIGNACIAN ART

The statuette found at Willendorf in Austria, with its curly hair, and the 'sorcerer' engraving from the Grotte de Lourdes (right), with its suggestion of wavy hair, are evidence of a marked diversity of type.

to lie near the surface and so helps the cooling of the blood in an over-hot climate. Moreover, these types have comparatively little hair and what they have is short. Their widely open nostrils and everted lips are other helps to cooling.

The pygmies mature early and have a life about as short as that of the apes (say forty years). They are at a very low stage of social evolution as trackers and hunters in the equatorial forests, one of the most unfavourable environments for mankind. Their short stature is probably connected with the hot, steamy climate, in which growth comes to an end at an early age.

In addition to these very small, medium headed people with spirally curved hair, there are in southern lands, or were till recently, peoples with heads varying from medium breadth with small measurements to considerable relative length. The two most notable examples are the Bushmen of South Africa and the recently extinct Tasmanians. Both have spirally curved hair; the Tasmanians were very dark-skinned, the Bushmen are less dark. They are not so short as the pygmies. Their location in the far south illustrates the pressure from the north. Hunters and gatherers, the Bushmen are also

skilled cattle thieves, preying upon the herding peoples near them, as some of their rock drawings show. Like the ancient hunter-artists, they are skilled draughtsmen and their remarkable folk-tales tempt one to think that tale-telling may also have been a feature of the life of the hunter-artists of old, to whom we must now turn, as probably representing one of the earlier emigrations from the grassland home of modern man.

Most of the remains so far discovered of people of that early period have been found in Europe and North Africa, and they show, typically, the lengthening of the head to which reference has been made. In some the nose was evidently

broad and the nostrils were widely open; in others the nose was narrower and stood out more prominently, probably in part an adaptation to the cooler climate, ensuring the warming of the air in the nose on its way down to the lungs. We know very little of their hair, but one early statuette suggests spirally curved tufted hair, while one or two drawings suggest wavy



hair like that of modern Europeans; probably both existed.

The brains of these early modern men were already much superior to those of more ancient types, so far as they are known; and the earliest men of modern type that we know obviously lived a more varied life with more initiative than their predecessors. Evidently life was becoming tinged with deliberation and forethought; our forebears were learning 'to look before and after,' and doubtless also 'to pine for what is not.'

The evidence of these people is mostly European, North African and south-west-Asiatic; they probably spread to Europe from North Africa, but they may also have reached it from the south-east either via the Russian steppe or via the Balkans. They were not by any means all alike, and at least four groups can be dis-



STONE AGE KNOWLEDGE OF ANATOMY

We may infer that the hunter-artists knew their anatomy from the drawing of an elephant in the Spanish cave of Pindal, with a heart indicated over the correct region, and of a bison in the Niaux cave with arrows pointing to the heart.

From Capitan and Breuil, La Caverne de Font de Gaume

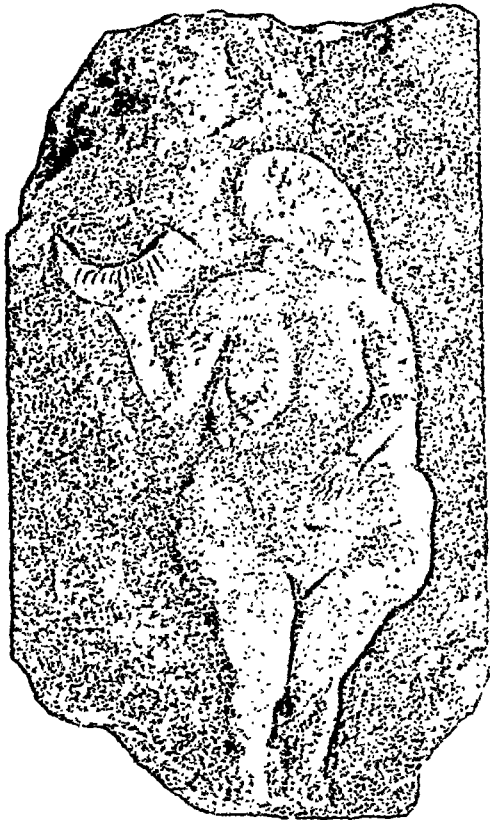
tinguished so far as their anatomy is concerned. One can also make four groups so far as their arts and crafts are concerned (see pages 254-5 and 256), and Menghin has recently suggested that the two schemes of groups correspond.

We have to infer what we can chiefly from burials, and the first point to be noticed is that no evidence of value has yet been found to suggest any cultivation of crops or herding of animals or making of pottery or grinding of stone. These arts, we shall find, develop later on; here we are concerned with people who still merely hunted and collected food, but who nevertheless stood far above the level of the Neanderthal types of mankind.

The burials show that social life had become richer than heretofore; there are instances of a man and woman buried together, of family and group burials, all

made with care and, one might suggest, with reverent affection. The bodies were often decorated for burial, whether they were those of men or of women or of children, and the decorations include fillets and necklaces and pectorals of shells, fish bones, teeth and the like. Red ochre was often used to colour corpses, probably to simulate blood, and their burials show that they had reflected on the importance of the head as the seat of intelligence.

Not only had they an idea of the importance of the head, they also knew something about the heart, as we may judge from the red heart painted on a mammoth outline, and the painting of arrows (some red) aimed at the heart region of a bison. One is tempted to think that they had meditated on the seat of the springs of life and mind, but



WORK OF A PALAEOLITHIC ENGRAVER

The tendency among the early hunter-artists of Europe to exaggerate female characteristics is nowhere better shown than in the famous bas-relief at Laussel in the Dordogne. It was carved in a difficult position in a rock shelter.

After Lalanne



LIGHT ON AURIGNACIAN BELIEFS

An explanation for the exaggerated female statuettes found on Aurignacian sites is that they were made by a negroid folk subject to steatopygy (over-development of the thighs) like the Bushmen. More probably they had a ritual meaning. These steatite figures came from the Grimaldi caves.

Photos by courtesy of M. Salomon Reinach

whether they had speculated on the origins of the world or of Man we have as yet no idea. Unless the burials found are all burials of leader-families, which seems improbable, we have no clear indications of a leader-class with special insignia or other marks of privilege, and it is likely that the people of the first dawn of European civilization lived in groups not very distinct from the family.

Now a subject of great importance to mankind is that of the growth of population. There seem to have been several occasions on which great spurts occurred—that due to the development of steam machinery and transport is fast weakening at the present time; that apparently connected with the large-scale organization of government and communications, culminating in Imperial Rome, was a previous phase; that probably linked with the spread of the horse as man's companion preceded this by rather more than two millennia; while that associated with the first rise of food production was about two or two-and-a-half millennia

earlier still. The bettering of climate after the Great Ice Age must have been an important factor in the increase that we are now considering, and it may be dated a few millennia before the invention of food production.

The loess-dwellers of that time and some of the cave-dwellers of France show by the details of their well known statuettes that the reproductive function of women was a matter of great moment to them, and that some recognition of it was as vital a feature of their social life at least as it is of ours. This aspect of the life and art of early hunter-artists seems to have become less prominent later on as food problems loomed more heavily with a partial return of cold.

The hunter-artists made a great speciality of the decoration of chambers, deep in dark caves, with pictures or, in

some cases, relief-models in clay of animals, and we cannot but associate this decoration with some form of ceremonial, perhaps conducted to bring the hunters luck. Bison are the commonest animals, but there are also deer, reindeer, wild boars, goats, mammoths, rhinoceroses, horses and fish. In one famous case a large number of animals is shown together. Typical representations will be found in Chap. 6. There is no painting of an ordinary human figure in the caves, so we can only guess how they hunted; but there is strong temptation to think that the hunting of herds of bison, mammoth and reindeer was collective or co-operative, and that the groups gathered, perhaps in large numbers, in the deep caves, either to beg for luck from the great hunters of the past or, more probably, to try to get luck through some kind of sympathetic magic.

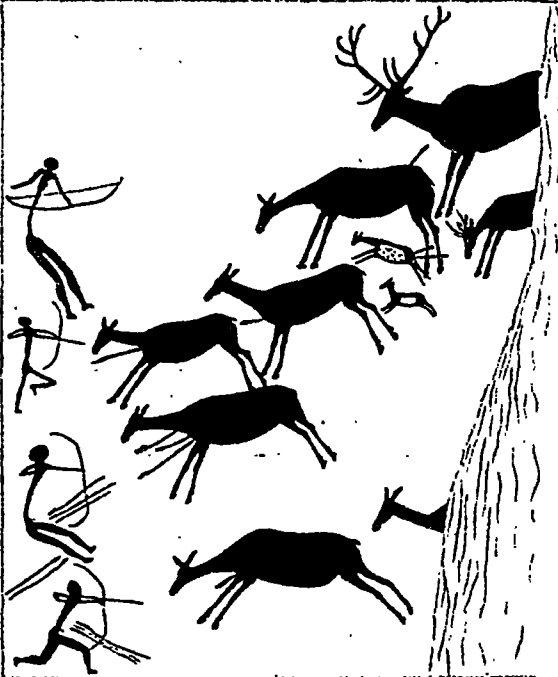
The footprints on the floors of the caves still remain to tell of long-forgotten rites. The painted caves also lead one to think that the hunter-artists had fairly permanent centres, and their habitation and



A group of women surrounding one man in a cave at Cogul, possibly a marriage scene, at least seems to show social organization among the Capsians in Spain. While the man goes naked the women are quite elaborately garbed.



Little can be inferred about the physical type of the Capsians from the huge legs with which they are sometimes shown—these may be an artistic convention.



In the south of France and Cantabria the prehistoric hunter-artists seem to have disliked portraying the human form. Luckily a contemporary school of art in eastern Spain, known as the Capsian, had no such prejudice, and we learn that the bow and arrow was already invented over 9,000 years ago. Save the topmost, these paintings come from caves in the Barranco de Valltorta.

MEN AND WOMEN PAINTED IN SPANISH ROCK SHELTERS 10,000 YEARS AGO

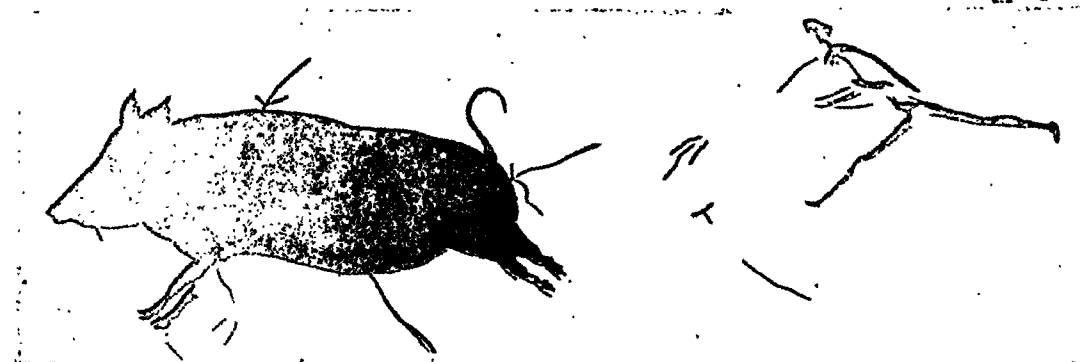
From Juan Cabré, El Arte Rupestre en España (top subject) and H. Obermaier, El Hombre Fósil



The bowmen in the previous page may be accidentally grouped; these from Morella la Vella are clearly engaged in mortal combat—our first evidence for warfare between man and man.



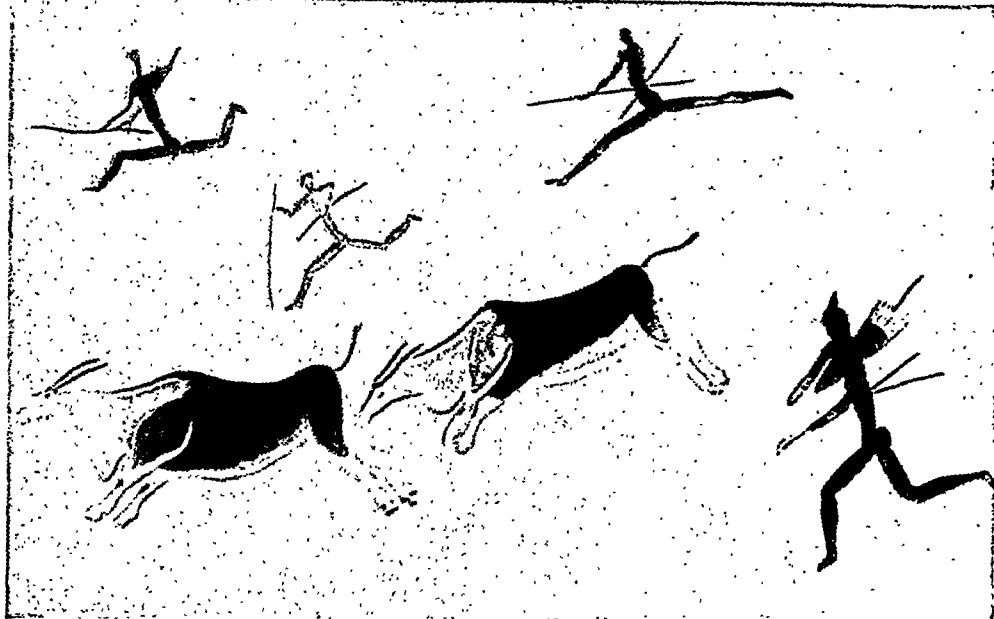
On the left is one of the most spirited of the Capsian paintings—a man collecting wild honey from a tree while the irritated owners buzz round him. We cannot say of what material his bag is made: probably leather. The others show male nudity contrasted with feminine trappings.



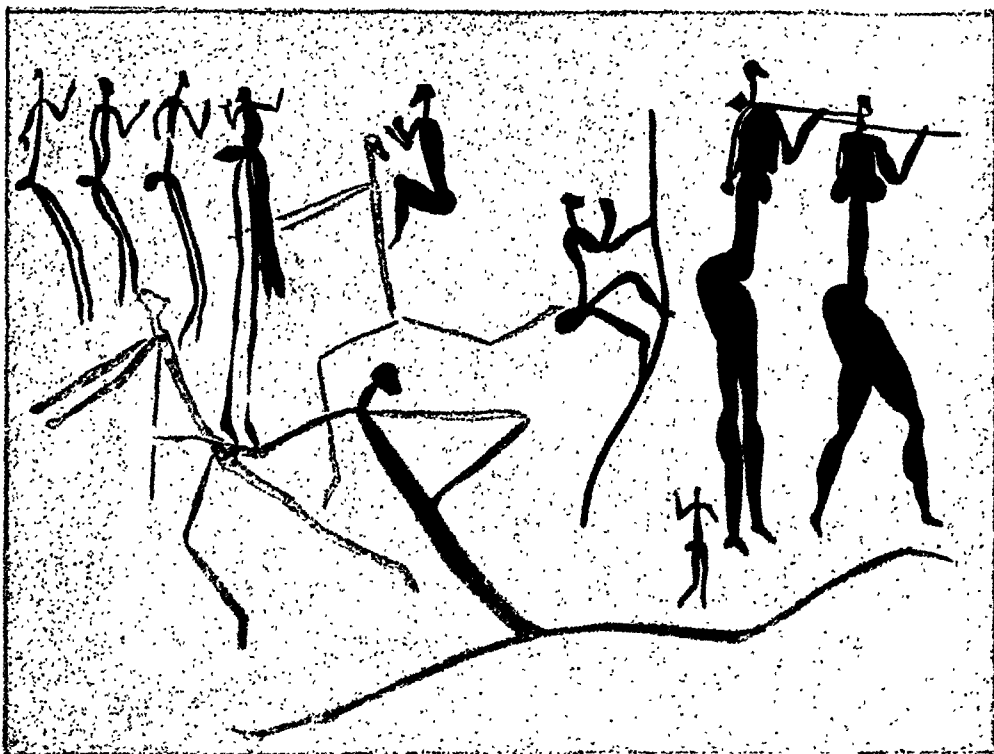
Many of the Capsian paintings, like all the Magdalenian, are preoccupied with hunting; for instance the boar hunt, above, from the cave of Chaco del Agua Amarga. But other interests appear, such as fighting, honey gathering (the hunters cannot have lived on flesh alone) and ritual dancing. The last is probably the occupation of the figures from the Alpera caves in the right centre above.

OCCUPATIONS IN THE DAILY LIFE OF THE CAPSIAN CAVE PAINTERS

From Obermaier, El Hombre Fósil (top and middle left), and Cabré, El Arte Rupestre (remainder)



Modern art of the Bushmen of South Africa—perhaps one should say 'recent' art, for it does not seem to have been practised for a century or so—provides such a parallel to the prehistoric Spanish paintings that one is justified in using them to amplify our knowledge of Capsian culture, without alleging any community of race. Above we see an eland hunt with spears and bows.



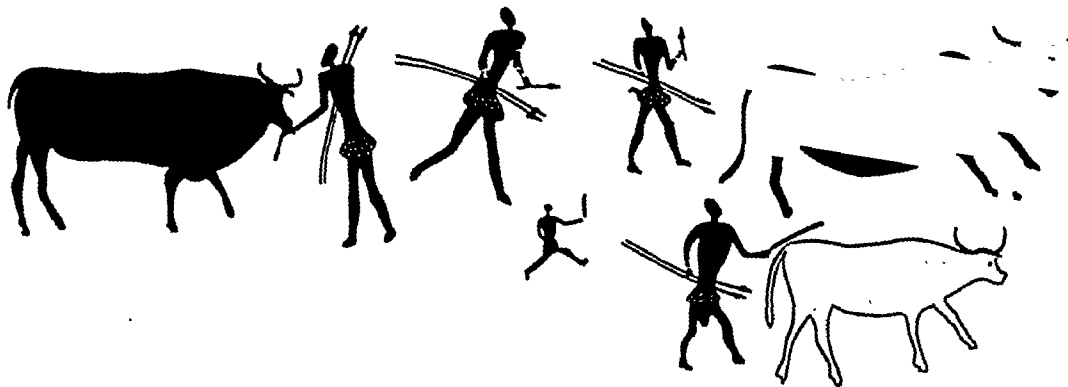
The scene at the top of the page is from the Esikolweni mountains. Here is another, much harder of interpretation, from Bushman's Klipp. The two women on the right, though unclothed, are not unlike the Capsian women in general treatment, while the man climbing a tree reminds one of the honey gatherer. Except in the lank figures in the foreground, steatopygia is very evident.

MODERN ART THAT GIVES A CLUE TO PREHISTORIC CULTURE

From F. von Luschan, Zeitschrift für Ethnologie



A ceremony of some sort seems to be in progress here—the men dancing supported on staves, and the women beating time with their hands. Are the men impersonating some object of the chase, a long-legged antelope for instance, as the treatment of their heads also seems to suggest?



This is a feature of Bushman life that can have had no parallel in pre-pastoral Capsian times. It represents a cattle raid; for the Bushmen, being the neighbours of pastoral tribes on a higher level of culture, are accomplished cattle thieves without practising any herding on their own.



The Bushmen are fast dwindling; had they died out before contact with the white man their drawings would have excited the same speculation as those in Spain. They survive to show, however, that a high level of art can be reconciled with a low level of culture. Here, the bowman stalking ostriches in an elaborate disguise may be compared with the 'sorcerer' in page 206.

HOW THE BUSHMEN OF SOUTH AFRICA DECORATE THEIR ROCK SHELTERS

Upper subjects from Helen M. Tongue's 'Bushman Paintings,' Oxford University Press

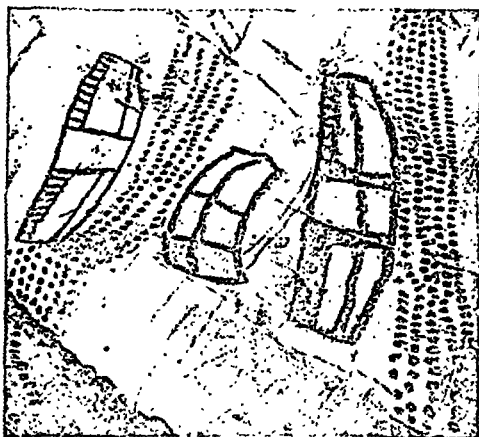
burial caves suggest long residence, so homes and fires were doubtless a feature of social life. Some so-called 'tectiform' drawings have been held to show that there were timber-framed dwellings.

Their tools, again, clearly tell us of thought devoted to securing success in hunting. Many of them are small flints, and different workshops—perhaps of somewhat different dates, perhaps contemporaneous in some cases—followed different types of technique. There were fashions in those days, and tools were clearly deliberately adapted to different purposes, to scraping and piercing, boring, cutting, engraving or etching, sawing, smoothing a wooden stick, straightening an arrow shaft and so on. The large numbers of little flint-points sometimes found suggest workshops and perhaps the carrying of spare parts by these old hunters—who seem to have had the notion of fixing flint on wooden shafts, an important invention. They were also taking note of the possibilities of bone, which could be rubbed to make spear heads, harpoons or needles, while hollow bones were sometimes used as paint boxes, to contain the red ochre they used so much. Ivory was also valued and worked for implements and ornaments. Stones were used as paint palettes.

Some burials have remains of leather aprons, so the hunters had clothing; even the children seem to have been clothed. This suggests that the bone-needles were used for sewing, and there-

Domestic crafts of fore sinews were probably the Artist-Hunters used for threads. We have no evidence of weaving or of felting, but animal hair found in certain burials suggests that the latter art may have been practised; it is known to some modern peoples who do not weave.

Why there are no paintings of the human figure at all comparable in artistic value with those of animals we can hardly guess. One may recall the fact that Islam to this day, like Judaism before it, rigidly objects to representations of the human figure, and it is quite possible that this prohibition is an inheritance from days long before the concept of the unity of God as a spirit had come into men's minds.



EVIDENCE FOR PALAEOLITHIC HUTS?

Certain cave-paintings called 'tectiform' have been interpreted as sledges, etc., or huts; they seem to show that the hunter-artists could construct. Some of these from the cave of Hornos de la Peña, Spain, might be taken for palisades.

There are, however, representations of the human figure disguised, and the most famous of these is that of 'The Sorcerer' in the cavern of Les Trois Frères. Here we have a painting of a man, disguised in a very composite make-up with stag-horns, an owlish face, and legs and tail of various animals. Miss Murray thinks that he may be compared with the Chief Wizard of the medieval witches' sabbaths (see Chap. 128), and the compositeness of the make-up suggests a comprehensive, as it were synthetic, scheme of sympathetic magic. This figure and a few others, none of which has much detail of a face, have been thought to indicate that the hunters had magician leaders, a very probable suggestion. Disguises for stalking prey are a well known hunter's device, and a skilful use of a disguise may easily have led to ascription of special powers and to magician leadership.

Much attention has also been devoted to impressions of hands with mutilated fingers on cave walls, since this custom of mutilating a finger, as a token of grief or for some other social reason, is widespread, even if often in make-believe fashion.

The more or less contemporaneous civilization in eastern Spain was rather different in some ways. Here a great feature was the making of drawings not in caves but on rock surfaces. Here, too, the aim of the artist was not the fine,



SORCERER IN ANIMAL GUISE

Rare though the human figure is in the more northerly cave culture (except for female statuettes and reliefs), we do find paintings of men in disguise. These were probably magicians, the dress being a form of game-stalking device, as in this painting in the Trois Frères Cave.

Courtesy of Mr. M. C. Burkitt

sometimes polychrome delineation that the artists farther north strove to obtain, but rather schematisation of outline and the depiction of scenes in which human beings play a part. These drawings are full of movement.

The human figures are conventionalised in various ways, and in the end the conventions become extremely simplified. The men are naked, the women wear skirts and some kind of sleeved shoulder wrap. They are often in groups, and in one instance a group of women is shown around one man (see page 201). Whether this has relation to marriage schemes or not we can hardly say, though it is probable. The paintings of eastern Spain show men fighting one another and hunting with bows and arrows, and there is no longer any doubt that these were in use in the days of the hunter-artists; indeed, it may well have been the invention of the bow that increased their power and numbers and so made life richer and more varied.

About the middle of the long period during which the hunter-artists lived in

western Europe people came westward along the loess and brought with them a wonderful technical skill in flint chipping, as shown in the fine 'laurel-leaf' implements known as Solutrean, from the station of this age at Solutré in Burgundy. They appear to have been horse hunters, and their culture penetrated to south-western France, and even to northern Spain; but it died away again, and the continuation of the older Aurignacian civilization which then developed is called Magdalenian.

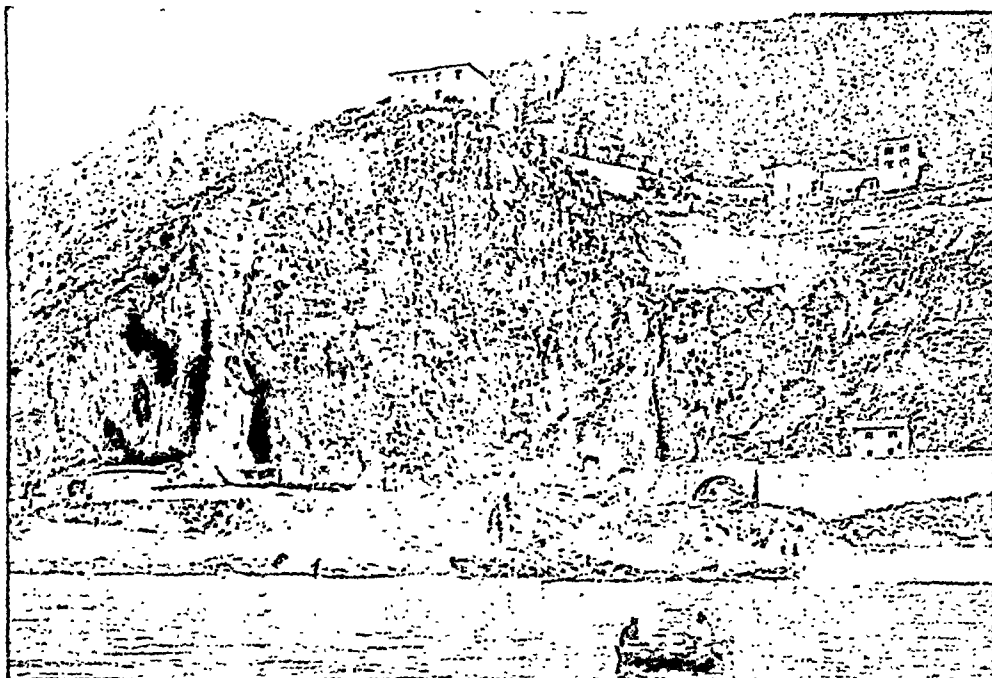
There can be little doubt that we have amongst us survivals not only of the people of the age of hunter-artists—some of their types are fairly clear in modern populations—but also of their ideas and customs. We must not imagine them to have been very different from ourselves in their little weaknesses, however much they differed from us in their expression of their feelings and thoughts about the world. There is no ground for ascribing to them any special form of social organization such as the primeval communism which has sometimes been imagined.

They must have been adopting the habit of deliberate purposive labour with some organization gathering around it, and we may well imagine that there was some differentiation of labour. There was rough acknowledgement of mutual obligation, there was a recognition in eastern Spain of some distinction of race between giants and dwarfs, and

some think that there is Social life in the also evidence of warfare. Old Stone Age

No doubt most members of society, then as now, dropped naturally enough into their places in the group and accepted the duty of labour with those little slacknesses and evasions that kept society from fossilisation. The burials of mothers and children, an east Spanish picture of a mother and her child, and many other points, however, hint that society was become closer knit.

Sollas and others have drawn special attention to the parallels between the hunter-artists of old Europe and the Bushmen of South Africa. There is doubtless a good deal in this idea, provided that we do not too closely identify the ancient population of Europe with the modern one



Late palaeolithic men were hunters and, therefore, probably, to some extent nomads; so that it may give a false impression to speak of their 'homes.' But they certainly took temporary refuge from cold and wild beasts in rock-shelters and shallow caves. Such were the Grimaldi caves at Mentone, which were used for dwellings, as shown by the remains of hearths, and also for burial-places:

From Les Grottes de Grimaldi



Very different from the normal refuges of the hunter-artists were the caverns where they executed their masterpieces of animal delineation. These were tortuous passages carved by water-action out of limestone bluffs, and in their dark recesses were probably enacted strange scenes of magic ritual for ensuring prey. Note the wall paintings in this chamber of the Niaux cave in the Dordogne.

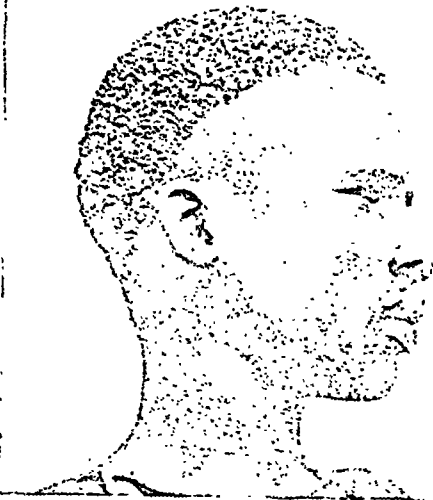
WHERE CRAFTSMEN OF THE STONE AGE LIVED AND DREW THEIR MASTERPIECES

of south-west Africa. Both belong to early varieties of modern man, so they have points of resemblance; but these are not full enough to enable us to speak of Bushmen in ancient Europe. The Bushmen make rock drawings not without resemblance to the ancient ones of eastern Spain, and the fact that tale-telling is another of their arts may be said to allow the guess that our hunter forefathers in palaeolithic Europe had begun to tell tales around the social fire, though not yet, as we shall

see, to recite legends about heroes of the past and their exploits.

Almost all who can be considered as possible modern representatives of the old hunter-artists, with much lengthened heads, have societies modified by influences from the food-producing societies to be discussed later. They are mostly in what must be called the uttermost parts of the earth if we look upon the early home zone, Mesopotamia and the Sahara, as the centre for our purpose.

On the south side of the early home zone we find in Africa a population that is mainly long headed, with broad noses for the most part, spirally curved head hair with curved superficial roots, very little body hair, a skin that is supple and oily and has few dry layers, rich vascular supply beneath the skin, large sweat ducts, everted lips and a body generally adapted in most details to giving off superfluous heat. Varying amounts of what we may call pygmy heritage are scattered among negro populations, while towards the north the hair shows variability and there has been a good deal of immigrant blood from regions north and north-east of the Sahara. Most African peoples have rather erect foreheads without brow-ridges, but these do occur among the Koranas far to the south. This is



ADEPT BUSHMAN HUNTERS WHO DRAW LIKE THE STONE AGE ARTISTS

The Bushmen who make (or whose ancestors made) the rock drawings shown in pages 203 and 204 are representatives of the earliest southward drift of long headed men, with a considerable admixture of a yet earlier pygmy strain. The slight lengthening of the skull is well shown in the head of a Kalahari or Heikum Bushman (left); on the right is an old woman of the same tribe, while above is a Cape Bushman with his bow and quiver of poisoned arrows.

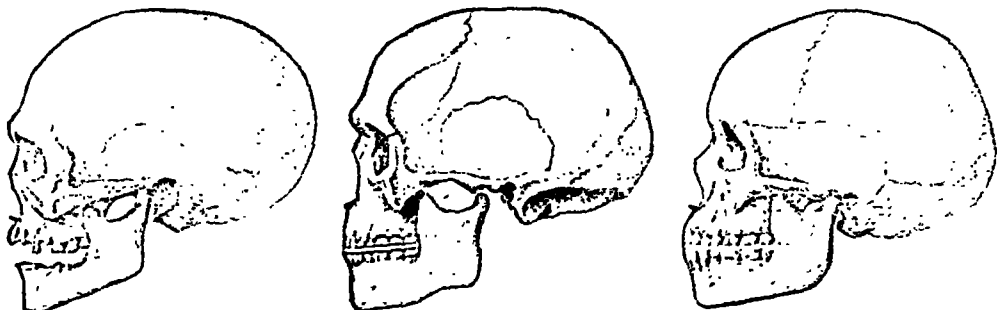
Heikum Bushmen, by courtesy of Denver African Expedition

interesting because strong brow-ridges occur in some of the Aurignacian types and in the Australians.

No full reason can be given for the general dark colouring of the African skin ; it is a feature common to many of the types pressed out from the south side of the early home zone. The dark colouring once distributed in the hairs of the animal ancestors may have become concentrated in the skin in these peoples, or the dark

brow-ridges, the Australians are certainly representatives of a fairly early stage in the evolution of modern man.

Similar types are the Veddas in Ceylon, and some jungle tribes in south and central India. Melanesia, the island group east of Papua, has types like the Papuans mixed with later migrants. The Veddas and some Papuans are hunters and gatherers, and there are still groups in south India which do little cultivation ;



BROW-RIDGES AMONG MODERN MEN, CONTEMPORARY AND PREHISTORIC

Apart from the pygmies and the Bushmen, the bulk of the African population shows the typical lengthening of the skull which is assumed to have been the first development in the early home zone. Brow-ridges are usually absent ; but the Koranas (left) have them, which is interesting as some Aurignacian types are similar (centre, from Combe Capelle). Right, a Tasmanian for contrast.

Korana skull from R. Broom, Journal of Royal Anthropological Institute

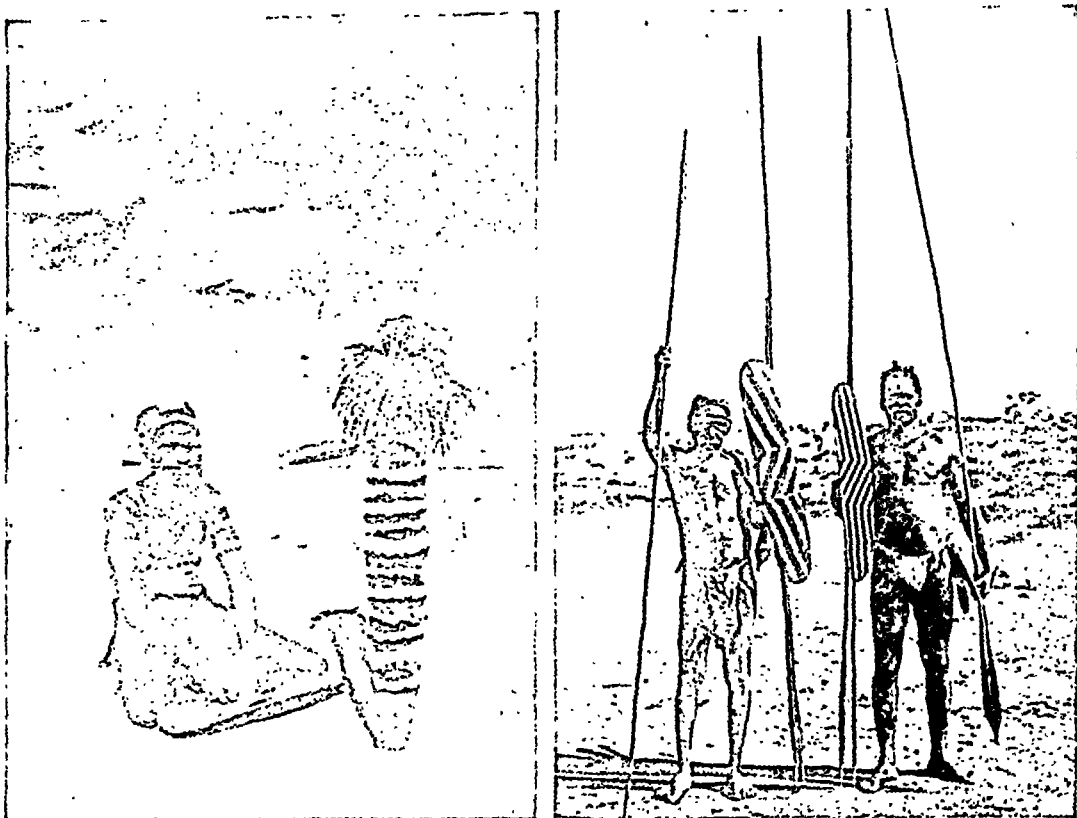
colouring may serve as an absorbent for the blue rays of the sun which would otherwise harm the skin.

The spread of modern types of men from the early home zone southward into Africa was essentially a spread from the south flank through what were then the desert conditions of part of the Sudan. It was taken, we may be sure, by the less fortunate and less well equipped.

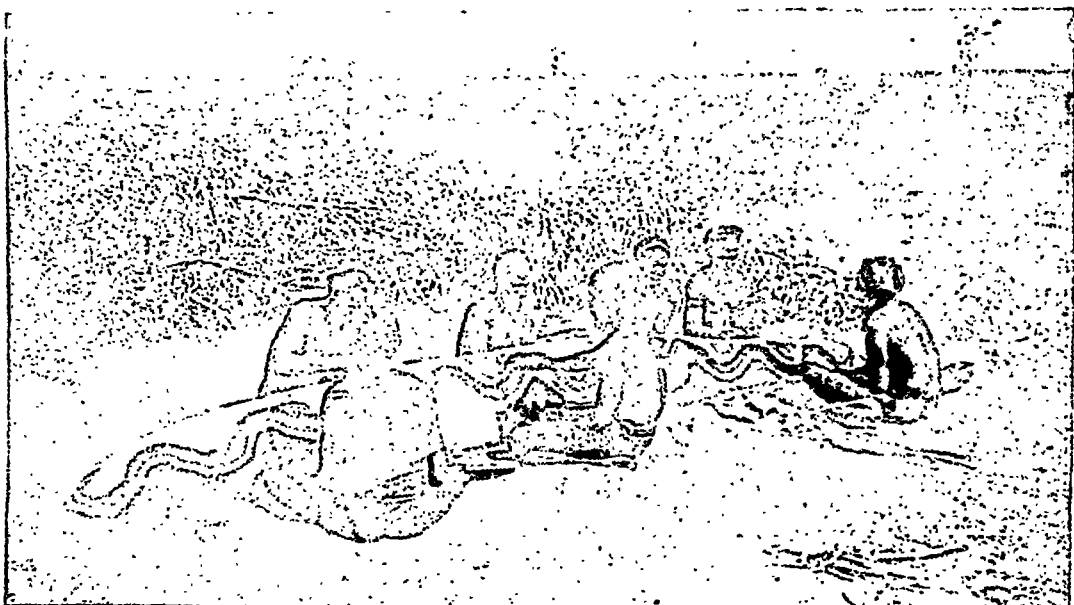
If the early home zone extended eastwards to Persia, the spread to India, south-eastern Asia and beyond was a spread from the end of the zone, including both flanks, rather than from the southern flank only. We accordingly find some peoples with wavy and some with spirally-curved hair among the dark, very long headed types. Spirally curved hair, but longer than in most parts of Africa, is characteristic in Papua, which has pygmies as well. The native Australians have wavy hair and, in the north, skulls that are narrow, very long and high, and provided with strong brow-ridges remarkably like those known from Aurignacian Europe. In many points, such as jaws, teeth and

but, speaking generally, the arts of cultivation and domestication of animals have spread over south-eastern Asia and its adjacent archipelagoes ; and the communities of this region will be discussed later.

The isolation of Australia was increased by land-sinkings before the art of cultivation spread so far, and the native Australians have remained in the hunting and gathering stage. Nevertheless, there have been influences exerted by occasional strays. Australia has the dingo, a dog-like creature that must have been brought by man ; it may have come with the original migrants. Again, some peoples of Australia mummify their dead by drying the bodies in the smoke of a fire of green wood, and somewhat similar customs occur among North American Indians ; some, however, consider this a survival of very early practices. Further, the peoples of north-eastern Australia have canoes which are outriggered, and therefore akin to those of Papua and Melanesia. Australian communities may thus owe features to 'strays'—arts and ideas half forgotten or decadent.



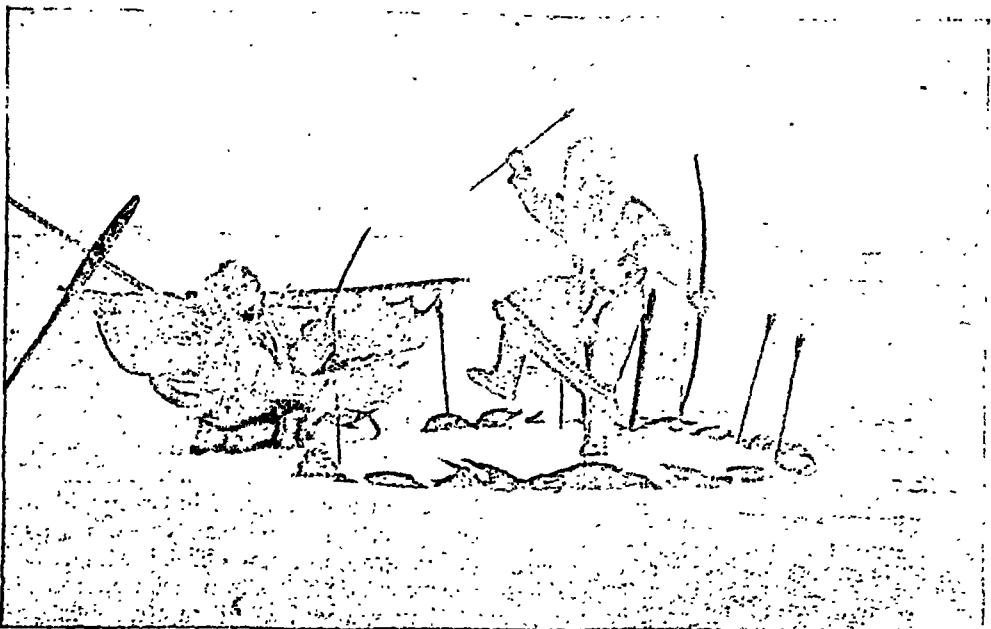
Primitive long-heads like the Bushmen, the Australian aborigines are distinguished by their freedom from pygmy blood, and by their wavy instead of woolly hair. Most of them live by the chase, using long spears and spear-throwers, and by collecting roots, ants' eggs, grubs of various sorts, etc. Typical of their beliefs is the totem; the man on the left is performing the wild-cat ceremony.



A totem is always a natural object (unlike 'fetishes,' that may be artificial), with which an individual, a tribe or a division of a tribe stands in intimate relation. Furthermore, it often includes the whole group of such objects, e.g. all kangaroos, all 'witchetty' grubs, etc. But conventional representations of a totem are frequent at the ceremonies, as here where the Wollunqua, an ancestral snake of the Warramungas, is portrayed by a mound decorated with white down and red ochre.

AUSTRALIAN ABORIGINES: THE LIVING COUNTERPARTS OF STONE AGE MAN

Top left and bottom photos from Spencer and Gillen 'Across Australia,' Macmillan & Co., Ltd.

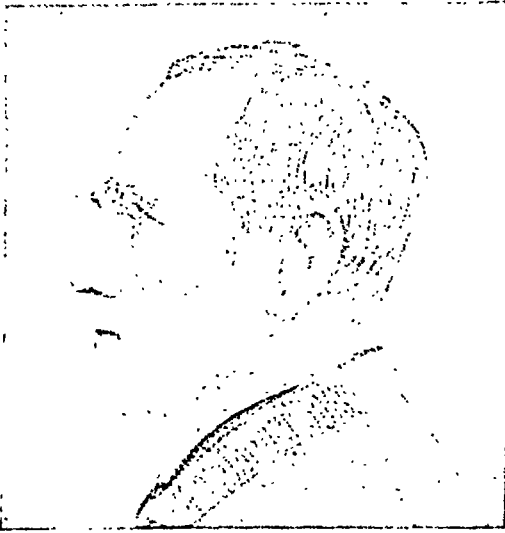


In the far north, as in the far south and east, we may trace the survivors of the primitive long-heads. The Eskimo deserve especial notice, as their way of life may not be so very different from that of the Stone Age fishing communities. This hunter, for instance, performing a 'duck-dance' amid the victims of his bow reminds one that the hunter-artists probably performed ritual dances.



Hunting and fishing, and the making of the necessary implements, are the main occupations of the Eskimo of Greenland and North America, but the domestication of the dog almost certainly marks an advance over the palaeolithic hunters—note the dog in the background. Both sexes are adept in a boat, and the men are expert with bow and harpoon; but it is woman's especial work to prepare the skins and sew them into clothing. This woman is pegging out and stretching a bear skin.

LIFE OF STONE AGE FISHING COMMUNITIES REPRODUCED BY THE ESKIMO



SURVIVOR OF AN EARLY TYPE

Descendants of early long headed types may be observed in the remoter corners of Europe. Notice the great length from the eyebrow to the back of the skull in this Welshman.

of endurance. The group is a local one, usually formed of a few families with hunting rights over certain areas, and is part of a union of several similar groups, each with its headman. The members of a local group need not all be members of one totem, nor will they usually have a totem to themselves. The languages, marriage-rules, funeral customs and so on of the Australians differ widely from group to group, and there has been much dispute as to whether they have a belief in a supreme spirit, above the myriads of spirits that stand for forces of nature.

The very long headed early types of modern man also spread northward from the home zone above described, doubtless as the ice sheets diminished, and we find their types of skulls in graves and also among modern populations in various parts of the northern hemisphere. In Sardinia, north Portugal, the Dordogne region of France, the moorlands of Wales and West Ireland, the remoter inland parts of Norway and elsewhere, the type of skull lingers still, but in these cases it is associated with ordinary European dark hair and only slightly swarthy skin, and the people concerned are not distinct socially from their neighbours, though as they survive in the remotest spots they naturally belong to communities that are rather behind the times. Those amongst

them, however, who have the pluck to leave their secluded homes and to go out into the world often achieve considerable distinction.

Some of the Ainu, the old-fashioned people who still survive in North Japan and Sakhalien, are said to be of this very long headed early type. Many more survivors occur in America. Foremost among them are the Eskimo, who have evidently long been masters of their icy environment. They combine the type of skull above noted with a yellow-brown skin and the straight hair so characteristic of the peoples of eastern and north-eastern Asia, and with a narrow nose, as one expects in such a climate. The longest heads are found in Greenland, and the type, when followed westward, more or less grades into the broad headed type characteristic of eastern Asia.

They hunt the caribou, the musk ox, the whale, the seal and the walrus, and they use the dog; they also fish and catch birds, collect driftwood, birch bark and some vegetable foods. They specialise on implements of bone and horn and ivory; the women are expert sempstresses, the men are very skilled hunters, and both sexes manage boats well. They have some skill in drawing and in telling tales. They may not have been in Greenland from very early times, but their complete adaptation to Arctic life makes it almost certain that they have been in the far north somewhere for several millennia.



AN ESKIMO AND HIS DIET

The narrow nose and straight, lank hair of this Alaskan are typical Eskimo features. He tears his animal food like any Stone Age hunter, and his steel knife is the only anachronism.

There is little differentiation of function in an Eskimo group except between the men and the women. Their groups have very little organization, but life is regulated mainly by the cycle of the seasons. Totems are not a feature of their thought.

Apart from the Eskimo, there are native American peoples, of the present or the recent past, who include amongst them individuals, sometimes in considerable proportions in remote

Early long-heads groups, with the same very
in America long, narrow and often
high heads which we have

been tracing in various regions. They have been noted in New England, in California, in parts of Central America, in Colombia, in Ecuador, on the Brazilian plateau towards the east and in the extreme south of the continent and elsewhere, and there can be little doubt that their distribution represents the pushing out of an early variety of modern man.

The distribution of the very long headed peoples, retaining a type of skull characteristic of early modern man, has been followed in some detail partly because it has helped to show the distribution of the few surviving groups of hunting and gathering communities, partly because it is hoped that this study has revealed how difficult it is to classify human races. We are dealing with a number of human drifts, all becoming modified slowly in the course of time through adaptation to the regions traversed and inhabited. Moreover, hardly ever can we say that there has been no interbreeding with other stocks.

The societies of the hunter-artists of ancient Europe seem to have left little of their inheritance to later times; and when we study modern groups which are dependent on hunting, we find that all are in great difficulty owing to inability to face modern civilization. These old-fashioned societies are fading away, while many of the societies of lowly food cultivators are maintaining, and in some cases increasing, their numbers, despite dangers due to contacts with the white man.

The invention of food production and associated arts made an immense difference to Man, and gave increased permanence and organization to his societies.

Larger numbers were able to live side by side with some sort of order. Diseases took their toll, no doubt, but residues survived and populations acquired a measure of resistance.

Exchanges multiplied and languages apparently acquired more widespread resemblances. The smaller societies of the hunting phase, in their relations with food-producers, lack the underlying 'common measure' of mental processes that helps the lowly cultivator to face even modern Europe; they lack the adaptability shown by the lowly cultivators, when they continue their gardening and get food for themselves and their dependents even if European intrusion disintegrates their social order.

The hunting societies usually lack any well-developed system of writing or records, they almost always lack genealogies, and with this goes the absence of legendary tales of heroes, at least legends of any fulness. They usually have ideas of sympathetic magic, that is, they believe that they can influence an object, such as their prey, by influencing its simulacrum, a painting or a model, or something



AURIGNACIAN ARABESQUES

Above: concentric circles, perhaps suggested by the eyes of wild beasts, discovered at Lourdes. Below: spirals—inspired by antlers or mammoth tusks?—from Arudy. Both are carved in ivory.

that is associated with that object, such as the teeth. It is quite possible that utilitarian magic of this kind was one of the main factors of the ancient art of the early hunters, but we should not exclude the play of fancy and the pleasure a carver might get from shaping some design on his weapon, while perhaps he was spending hours waiting and watching for prey. It is interesting that already among the old hunter-artists we find instances of the use of concentric circles and of spirals as

decorations; these have an immense development in later times, if the later examples can be said to be the result of evolution from those of the Old Stone Age, a point still far from proven.

The hunting societies of to-day are usually without marked class distinctions, and this may perhaps be taken to suggest that class distinctions did not develop

far among the old artist-hunters. In particular, there are no very regularly recognized chiefs or priestly orders, though wizards or magicians are usually found, and we have already seen reason to think that they functioned among the early hunters. Priests in the fuller sense are an accompaniment of a more established tradition.

Reference has been made to the careful burials of the palaeolithic peoples and to the possibility that they had some dream of spirit-survival. It is quite likely that they wished to propitiate a dead person lest he should return as a harmful ghost. Some skeletons have been found in positions which suggest that they were securely tied down, while others were carefully covered with heavy stones. On the other hand, we may well have indications of affection or reverence in ancient burials. Burials seem to have been made in several cases within the habitation, and possibly, as among the Veddas, the habitation may have been abandoned, perhaps closed up as well, during putrefaction. There was quite possibly some idea of protecting the bodies from wild carnivores.

There seem to be no indications of funeral feasts, and only doubtful and rare hints of ceremonial connected with the bones of the dead. Women were often buried at least as carefully as men, and nothing can be inferred concerning sacrifices of widows or slaves at the grave, such as have occurred in several regions in later times.

Animism is a philosophical term used to cover a belief, prevalent in a vague way among hunter-societies and peoples at a relatively low stage of social evolution, in an energy belonging to persons, animals or even objects, yet distinct from those objects; and rites and ceremonies of a

magical nature have arisen with the idea of gaining the help of that energy or avoiding its use in a hostile sense. Studies of Melanesian society introduced the term 'mana' into scientific discussion to cover the idea of a power that is supernatural and impersonal though it works through persons and objects. This idea seems to have a wide distribution, and there has been discussion as to whether it gave rise to animism or vice-versa; probably this question is of secondary importance. It is likely that the idea is very old.

It is quite probable that the experience of dreams very early led Man to the conclusion that his spirit or 'ego' was distinct from his body and could wander off in sleep, even to the realms of the dead, with whom converse might be held. This, or even more rudimentary forms of what later became religion, is all that we have any right to think was practised by the old hunter-artists. But their fine physique, their artistic powers and their evident, if temporary, triumphs over difficulties leave a tantalising doubt as to whether their religious interests were not more developed. We cannot doubt that they realized the social value of ceremonial, with its inflaming, inspiring possibilities; but we have no ground to assume that they had a true priesthood.

With this summary in our minds, and remembering that analogies between ancient hunter-artists and recent hunting people may be quite partial only, we may proceed to think of the crisis that blighted hunter-artist life

in Europe, a crisis strikingly different from that, due to contacts with cultivators and industrialists, which has blighted the societies of hunting-peoples still lingering in our world.

The crisis followed the retreat of the ice sheets and the accompanying sinking of land around the coasts of Europe. The belts of climate shifted northwards toward their present positions and forest, at first largely pine, spread over what had been cold, grassy plains. The big beasts of the older time retreated from the now wet, forested lands, and in Europe these yielded few, if any, food plants that could have been cultivated even if the human

End of the Stone
Age hunters

societies of the time had proved able to take up the art of cultivation. The evidence, admittedly scanty, points to the decline of society and the arts, and to survivals of impoverished food-gatherers in various situations such as along seashores and river banks, where shell-fish and the like provided food.

The crisis was a very serious one, for even at the present day the regions of cold, coniferous forests are in many cases considered too poor to cultivate. The common coniferous trees of high latitudes are organisms with slow root action and compensating slow evaporation, able, therefore, to survive in cold soil, for soil temperature is a prime factor of the rate of root action; it appears to be just this difficulty of adequate root action that hinders the growth of good food plants in many cold pine-forest areas. It is true that, in western and even north-western Europe, the pine forest was succeeded and squeezed out by the deciduous temperate forest as climate further improved, and deciduous-forest land, if the soil is reasonably good and fairly deep, is generally worth clearing for cultivation. But, even if there had been food plants at hand, it is doubtful whether the artist-hunters would have invented cultivation.

They had gone through a phase of depression, they had retreated before the earlier phase of the crisis, and it appears to be enormously difficult for a society that has retreated to brace itself for a fresh advance on new and untried paths. So western Europe hung back in the cycles of change and became for a while a mere barbaric fringe, barely in cultural contact with peoples advancing elsewhere.

After the passing of the Ice Age, a great local burst of invention and social organization changed human society

in lands of the eastern Mediterranean and south-western Asia.

It used often to be said that hunting society gave way to herding, and that progress was through herding to cultivation; but this is increasingly doubtful. Food production through cultivation seems to have been the central invention of the great social revolution, but it was accompanied by many another invention, and a well-known scholar remarked recently that all the fundamental inventions had been made by the end of the Ice Age or soon afterwards, our later inventions on this view being only extensions of great principles then discovered and applied.

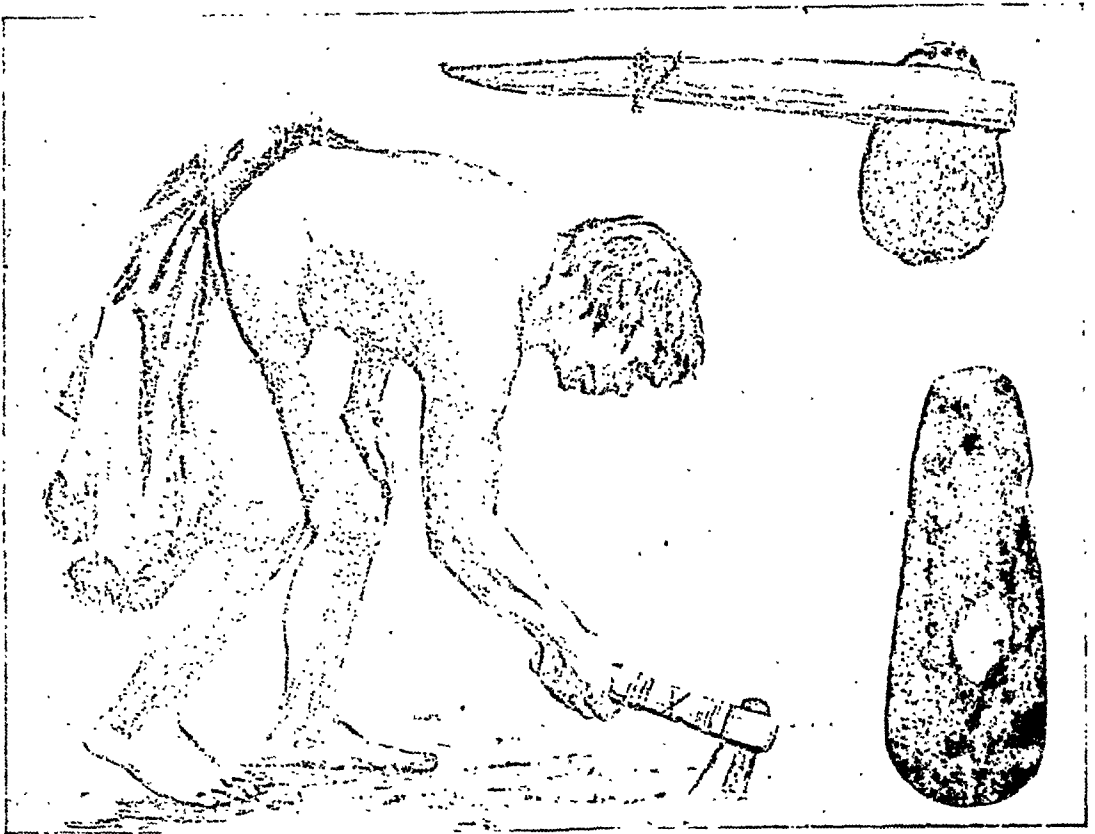
The most widespread of the cultivated plants are the cereals, and of these wheat



SIGNS OF REVERENT BURIAL 13,000 YEARS AGO

A burial in the Grotte des Enfants (one of the Grimaldi caves—see page 207) was found to hold an old woman (left) and a young man, dating from early Aurignacian times. The chaplet of shells on the man's head and the bracelets on the woman's arm reveal careful and reverent sepulture.

From Dr. R. Verneau, Les Grottes de Grimaldi



HOW AGRICULTURE EFFECTED A REVOLUTION IN THE WORKING OF STONE

When the hunters of the Stone Age could no longer compete with the changed climatic conditions brought about by the retreat of the ice, it looked as though human culture were receding from its high-water mark. The invention of agriculture, however, gave civilization a new spurt; an attendant discovery was the art of grinding stone, as in the tool (bottom right) from Warren Hill, Suffolk.

How primitive cultivators hafted and used this crude hoe is suggested in the reconstructions.

and barley seem to be the oldest still in use. The ancestry of wheat is not well known; it is a hybrid, and some ancestral plants seem to have belonged to south-western Asia, somewhere around what Breasted has called the Fertile Crescent ringing the Arabian Desert on the north. Wild barley is native to south-western Asia and north-eastern Africa. The art of cultivation arose in some part or parts of this region. As the climatic belts shifted northwards to their present positions, an orderly succession of seasons established itself with rain in winter and rivers filled by melting snow in spring, and with a hot, clear summer following thereafter.

Such a regular succession of seasons encouraged cultivation once it had begun, but as to its beginning we have, as yet, practically no evidence. We may fancy that in the valleys among the hills the women looking about for food would clear with stone picks space for the freer growth

of plants which they knew would later yield them grain. From some such beginning, or from the happy consequences of leaving an offering of wild grain with the body of a dead tribesman, cultivation could take its rise. It has often been suggested that the spring sacrifice (once human, later animal) to secure fertility of crops points to the latter origin. Both are probable, and others could be suggested.

The use of a chipped stone for digging would smooth the edges and could lead the user to see that stone tools might be shaped by grinding. Stones other than flint lend themselves to grinding, so that men were freed from their earlier main dependence on flint, and this was an important gain, especially for the peoples of the valleys in regions of old rock, where flint is very scarce or absent. The typical ground stone axe is a useful hoe and a fairly good wedge, and it can split wood as no chipped flint could. A new

command over wood gave increased possibilities of hafting, of leverage, of making stone-armed, wood-handled diggers, of building dwellings and palisades near plots of grain. Definitive and durable settlement was thus promoted, both in order to guard crops and in order to enjoy a dwelling and the protection of a palisade, and we may be sure that numerous houses were gathered together for joint defence.

The mound at Susa gives evidence of a grain-cultivating community at first without domestic animals, but with ground stone axes and a considerable and concentrated population. It also has pottery, and that is another of the associated inventions that may have arisen in one of many ways. Once invented, it gave new possibilities of storage, of mixture, of food preparation, of softening grain for the baby, as well as of fermenting it to get exaltation for the adult into realms of magic and passion.

The mound also has copper objects, and this tells, if possible, an even more important tale. Once flint was no longer the mainstay of the tool-making industries of most regions—in other words, once stone-grinding had been learned—all sorts

of hard stones seem to have been sought and tested. Prospecting journeys began on an enlarged scale, and stones were tested, among other ways, with fire. The finding of copper, which could be shaped by hammering and could be softened by heat so as to be cast in a mould, was a matter of immense interest, though the copper tool was too soft to replace the stone one for many purposes.

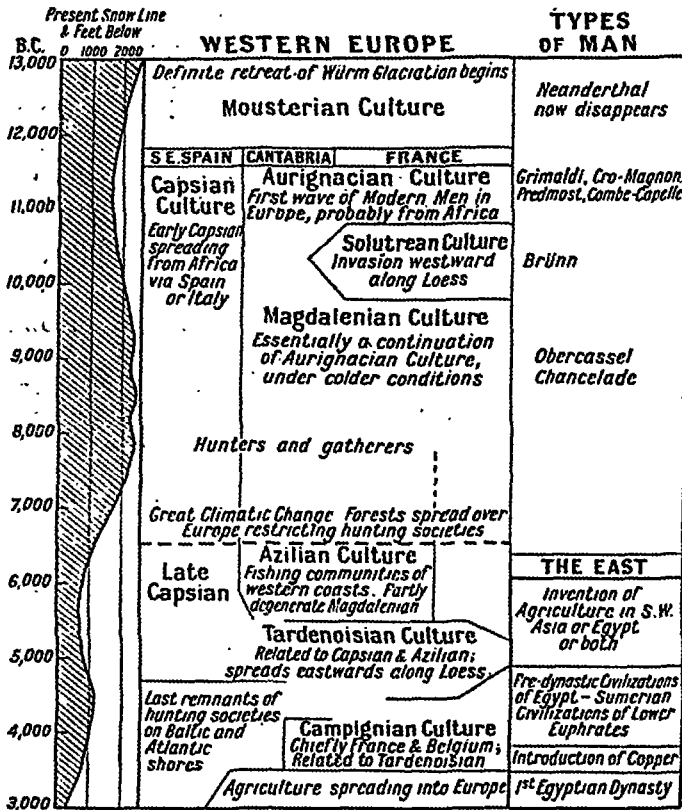
Without further trespass on the subject of primitive crafts, it is now possible to sum up and to suggest that human societies towards or after the effective end of the great Ice Age, probably somewhere in south-western Asia, developed a complex of inventions including cultivation, stone grinding, the wedge and lever, improved wood-work, pottery and the beginnings of metallurgy. The beginnings of domestication of animals followed these inventions very quickly; a palisade and stakes and cords could hold a captured calf till it was wanted for food, and might

bring the mother-cow under control and lead to her becoming a source of milk for the children. The domestication of cow, sheep, ass and dog, at least, occurred fairly early along with the great inventions mentioned above, and it is possible that other steps forward were also made, one being the invention of the wheel.

All these inventions made possible the rise of much denser centres of population than the world had previously known; population underwent a great expansion. That this increase in numbers, and the accompanying increase in complexity of labour and of leadership, led to great developments of social organization seems beyond doubt, and we have endless indications of this from Mesopotamia itself.

On the whole it seems likely that the complex of inventions just described was evolved more or less together, and for the most part in one region, though some may have been found out independently in different spots. The region probably included south-western Asia, with the plain of the Euphrates as its most important district, but some students, especially Elliot Smith and Perry, have laid immense stress on Egypt as the early home of the inventions of civilization. The controversy need not concern us here; we may provisionally think of the region between the Persian mountain border and the Sahara as furnishing early cultivators with vast opportunities of social development.

Clark Wissler has published especially valuable studies of spreads of culture, for example in his book, *Man and Culture*, where he shows how invention-complexes have radiated out from centres, some inventions spreading farther and faster than others. The centre may thus be surrounded by zones characterised by portions only of the invention-complex, those portions becoming generally poorer and smaller as more and more distant zones are reached. Kroeber's *Anthropology* gives other illustrations of the same idea; we might multiply further instances in many directions. The general idea is useful in helping us to picture fragments of the invention-complex spreading in the course of ages across the



LATE STONE AGE RACES AND CULTURES

Our colour-chart of Man's descent, which carries the human story back to pre-Chellean times, is too compressed to show in detail the cultures that multiplied towards the end of the Old Stone Age in Europe. This diagram amplifies the chart and carries it down to the beginnings of agriculture in Europe.

Sahara into intertropical Africa, the societies of which thus show intrusive features intertwined with older and more indigenous ones.

Fragments also reached north-western Europe, without a trace of metallurgical knowledge for a long time, and so the archaeologists of western Europe have spoken of a Neolithic or New Stone Age, a period when polished stone without copper was used (see Chapters 20 and 30).

In the cases both of intertropical Africa and of Europe the spread of culture was for a long time slow and partial, probably for reasons that are fundamentally geographical. There was a desert belt to be crossed in Africa and, further, the climate and insect pests of intertropical Africa both limited men's vitality and hindered the arts of herding. In Europe there were damp forests to be penetrated; and forests have frequently held up movements, especially mass movements.

It should be mentioned in passing that the phrase 'spread of culture' is one that needs very much more detailed analysis than space here allows. Mass-contacts of peoples may spread habits through wide imitation of one by the other, but even this imitation is likely to be partial and to be followed by adjustment of the acquired art to the previous knowledge of the learners. The passage of wandering craftsmen may spread an art, but they are often feared as magicians, and they have often taken great pains to guard their secrets. Imitation by the learners in this type of case is almost bound to be partial and temporary, though it may leave a leaven that influences subsequent history. It is considerations of this kind that make it so difficult to draw inferences, for example, from the types of pottery made by various early communities.

The early cultivators in lower Mesopotamia lived in

communities probably larger and more compact than those of any hunting peoples; they were mostly placed on defensible mounds near rivers, lagoons or the sea-coast; the people seem to have cultivated the edge of the river plains, doubtless with the help of the fertilising silt deposited by periodic floods when the snow melted on the mountain sides. In this lowland there were many river channels that could be cleared and even extended at need, and it is probable that men learned here to manage water, to bring it to their crops, to drain away excess. Irrigation is very old, and the need of many hands for this work was one of the factors promoting the increase of the size of communities.

Both digging the soil and digging the irrigation canals were hard work, and needed skilled direction by careful observers. The plants cultivated included wheat and barley, with the important supplement of the date palm. The Garden

Eden story suggests a primary dependence on fruit and subsequent condemnation to hard labour for food from the fruits of the field; and this is a likely story of the change from food-gathering, a region of date palms and other fruit trees, to food-production by cultivation. The communities obviously controlled their cultivated land, and we hear of many fights, for example between Lagash and Umma, that had their origins in quarrels about boundaries, quarrels that could arise only too easily on a flood-plain with shifting sands and streams.

If the early cultivators inherited animistic beliefs, that is, ideas of the existence of sources of energy connected with, yet distinct from, their bodies and other objects, we can understand the development of these ideas and of the social position of the magicians. Their life was becoming regulated in a more intimate fashion than of old, their link with their environment was becoming more complex, and their powers over that environment more marked and more direct. Especially on the flood-plains there was scope for the one-time magician to acquire real skill in foretelling times and seasons, to the great advantage of the cultivator; and the moon became an object of special study, for obvious reasons.

The community—settled in one place, gaining immensely from following a wise counsel and urgently needing a military leader to organize protection against enemies, who could play

How Chieftains such havoc now that cul-
first appeared tivation was the support
of life—naturally

developed leaders. These might be primarily kings, who might also perform rites to secure fertility of soil or beast, and so could be king-priests, perhaps like Melchizedek; or they might be primarily priests who ruled as well as performed rites and kept the traditional lore in their memories. Among leaders there was no doubt the anxiety for posthumous fame, and with a priesthood learned in many spheres there was the opportunity of treasuring genealogies with legends of heroes interpolated in them, as in the case of Nimrod. So folk-tale became supplemented by genealogy, often orally com-

municated, and then genealogy by heroic legend. Writing was a further step, though there are a good many instances in which an oral tradition has been held to be far more sacred than the written one.

Accumulation of traditional lore was clearly supplemented quite early by attempts at scientific observation, and in these cases a priestly class seems to have grown apart from the royal one and often in conflict with it. The ziggurats, or towers, of early Sumerian cities seem to express the social

Origin of the
Priestly Class

importance of a class of observers, no doubt of priestly rank. The story of the tower of Babel seems to tell of one specially great tower for whose building there were gathered together men of diverse tongues; the results were disastrous. A great development of communal expression with, later on, palaces and temples, kings and priests thus follows the rise of the art of cultivation and the attendant concentration of people into groups.

From a vague animism thought progressed to naturism, with the idea of a moon spirit, a corn spirit, a river spirit, a sea spirit, and so on, and also to the worship of the hero, king or priest, dead or living. The ideas no doubt intertwined; ruling families mingled them in their genealogies and gained the prestige derived from superhuman ancestry; and so came the worship of gods, in local hierarchies in many cases, but with progress towards an idea of order and of a supreme god, ultimately of the whole earth.

Visitors to the desert border know how often the boundary of the cultivable land is a sharp line; it is a case of 'everything shall live whither the water cometh.' On the one side of the line may be irrigated gardens; on the other poor, rough pasture with many thorns fades only too quickly into sheer desert. The early cultivators of Mesopotamia had rough pasture and desert flanking their cities, and the story of Cain and Abel illustrates the difficult relations between the cultivators of the cities and the herdsmen of the desert border.

We have seen that domestication of animals in south-western Asia is probably not quite so old as the beginning of cultivation. Domestic animals were

undoubtedly kept by the cultivators as far as opportunity allowed, but the people who lived on the rough desert border were forced to depend mainly on animals. In south-western Asia there were at first sheep, goats, asses and cattle; the camel and the horse were later introductions from the north-east.

Now, whereas the cultivator with some domestic animals can live completely on his own produce, with cereals, dates, milk products and some flesh food, it is hard for large groups of herdsmen of cattle, sheep and goats to thrive solely on animal food, even though they may supplement it by dates from the patches of palm trees which often occur on the desert edge. The herdsman of the desert border is thus drawn into relations with the cultivator, whose grain he may raid or, on occasion, even buy. He does not do much cultivation himself, and his group is necessarily smaller, more mobile and less attached to one spot than is that of the cultivator.

Nevertheless it has its territorial ideas, and these express themselves, in a dry land, as claims to springs and wells of water. Its leader is less hedged around with majesty than the ruler of the city;

he is, or has been in younger life, foremost in the endurance that is one of the most necessary qualities of the herdsman; he gathers experience and becomes the fountain of good counsel, and so tends to combine in himself the functions of leader and of priest, as the stories of Genesis suggest. The herdsman's leader lives among his people, and a group of his wives and children may often become a large enough unit for practical purposes; too numerous a group may need herds so large as to tax water supply and pasture, as we know from the account of the separation of Abraham and Lot.

The herdsman-group of the desert border is thus typically a large family group, consisting, at least in theory, of the descendants of a patriarch. The herdsmen must watch and bring back straying animals, must defend their herds against wild beasts and cattle-thieves, must be ever ready for feats of endurance, except in the case of the aged, who are venerated if experience has made them wise in advice or has given them a halo of sanctity through long performance of religious rites for the group. The need for this readiness on the part of the men has put upon the



AGE-LONG RIVALS OF THE CULTIVATORS: HERDSMEN OF THE DESERT-BORDER

The hard life of the herdsman on the border between the 'desert and the sown' breathes from this photograph of a Beduin encampment amid the Saharan wastes that stretch south from the skirts of Biskra. The pastoral group is a family one, its members having in theory a common descent; its ruler is a patriarch, and his followers haughty warriors who despise the menial city-dwellers.

women a number of heavy duties, such as the making, building and moving of tents, the making of clothes, the preparation of food and drink, as well as the care of children.

The herding group of the desert border is typically a tribe gathered around a patriarch who may have old and tried helpers as stewards; the tribe, at least in theory, is of one blood, its property is mobile, it is always ready for war, it protects its members as far as possible by the threat of the blood feud, requiring an eye for an eye and a life for a life, probably a life for an eye, too, on many occasions. The herding life is one of endurance rather than of menial toil, and the herdsman is a haughty fighter, proud of his genealogy, and apt to despise the cultivator working at the soil with his back bent, rarely free to roam, often unskilled in war and lacking in endurance of its hard conditions, descended from generations of similar humble folk who have lived massed together in societies based on mere neighbourhood rather than on the bond of blood.

It is difficult to add many new items to the material equipment of the Arab herdsman without limiting his mobility,

though some such introduced items, for example the camel and the horse, have increased that mobility very notably. Apart from such special innovations, however, these herdsmen are very conservative, and this has increased the gap in thought between them and the men of the cities in times of city prosperity. The desert border tribe dared not accumulate much treasure on earth; the city could do so if it prospered and kept up its defences.

In the early stages of food production in south-western Asia we therefore have two types of early society arising side by side, and, naming them from their later, well-developed forms, we may call them the city and the tribe. It would be as incorrect to suppose that the city originated through permanent settlement of the pastoral tribe as to imagine that the pastoral tribe is the city loosed from its moorings. The mental outlooks of the two societies were deeply contrasted; the

city society was based on neighbourhood with kinship as a subordinate idea, the tribe on kinship modified by adoption and other fictions. In the city writing, contract and legalism developed; in the tribe the spoken word, the oath of allegiance, the blood feud became outstanding.

Architecture, engineering, metallurgy and the potter's art became as characteristic of the city as leather work, mastery of animals and organized mobility were of the 'Sons of God' and tribe. In the city economic factors exerted vast influence; in the tribe immemorial custom interwoven with religious practice dominated life. The city was apt to entertain foreigners and to fuse originally alien elements into its life; the tribe, for all its rules of hospitality, was at heart exclusive. Rebekah said that she was weary of her life because of the daughters of Heth, and she dreaded the possibility of the marriage of Isaac to the child of a despised cultivator. Readers of Doughty's *Arabia Deserta* will remember the contrasts of mentality between the two groups which the author sketches with such skill.

These two groups were forced into relations with one another from earliest times. The tribesman saw the cultivators as a source of plunder, or he might earn from them a tribute of grain or of metal by vouchsafing the protection of his mobile force; David evidently expected payment from Nabal for his watch and ward. The citizen, with his limited space, was no doubt glad to buy the surplus animals of the tribesmen, especially as some domestic beasts, notably the camel when it was introduced, were apt to degenerate under conditions of riverine life. The tribesman, apt to organize and command and hardened to war, could look down into the feuds of the town and see an opportunity of taking command and of making the citizens do the menial work for him. So the tribesmen were the 'sons of God' and, already long before Rebekah, the story tells us of their attraction towards the daughters of men, the more softly-reared maidens of the cities.

From time immemorial it has thus happened that tillers have been dominated

by herders, who have married their maidens and so have gradually fused into the civic group, to be conquered in turn by new tribal incursions founding new dynasties doomed to vanish after some ten or twelve generations. From time immemorial, also, the mobile tribesmen have exchanged goods from city to city, gold and frankincense and myrrh.

There is greatly needed a carefully planned comparative study of early society in Mesopotamia and Egypt. In Mesopotamia the river network, marking off areas of cultivable land and allowing manifold communication, seems to have encouraged the growth of a considerable number of more or less equal cities. In Egypt the flood land was a narrow belt which would have involved long tramps or long boat journeys for many labourers if cities had been a general feature. In that land the grouped homes were and are villages rather than cities, except the great royal centres and a few others. In Mesopotamia the feuds between cities were a main feature of history for many centuries, and now and then some great organizer—one thinks of Sargon and of Hammurabi—built up a dominion of many cities. In

Egypt it was easier to dominate villages and to concentrate civic expression on one great royal city. It is true that the length of the flood-plain ribbon made difficulties, and led to the well known duality of lower Egypt gathering around Memphis and upper Egypt gathering around Thebes, with Abydos and other efforts at organization and social expression in the intermediate belt. But the unity of Egypt is as characteristic a feature of that country as the disunity of Mesopotamia in the early days of history.

Cultivation and herding almost certainly arose in south-western Asia, but possibly herding also arose, on somewhat different lines, in the grasslands of Asia farther north. While the great ice sheets of the days of early man dominated Europe and Central Asia, the west Asiatic lowlands, east of the Caspian Sea, were doubtless kept wet in summer by streams from melting snows. As the ice diminished, the gap between the Elburz mountains south and south-east of the Caspian Sea, and the Hindu Kush farther east became open to man; and on the other side of the barrier he found summer pasture far richer than he finds there now.



TWO INDO-ARYAN TYPES, LONG HEADED AND STRONG FEATURED

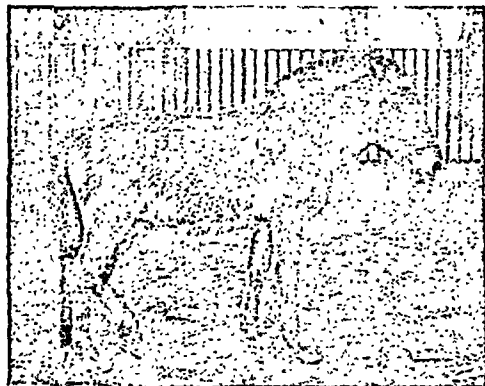
The term Aryan has fallen into disrepute owing to the confusion involved between language and race, but we may use the term Indo-Aryan, or Indo-Afghan, for the long headed, dark haired but not very dark skinned invaders of India, of whom this Afridi (left) and Pathan are good examples. The original Iranians (Persians) and the fair haired Nordics of the Baltic shore are akin to them, but few other speakers of an 'Aryan' tongue. For their movements, see map in page 230.

With the retreat of the ice Man may also have reached these grasslands from Europe by adventuring eastwards along the loess (see page 195, and the illustrations in pages 193 and 220). The little flint implements of the phase of decay of the old hunter-artist life, called by archaeologists Tardenoisian, occur here and there along the loess zone. From one side or the other, then, from the west or the south-east, or both, we may think of hunters and gatherers spreading into the Asiatic grasslands east of the Caspian, rich in wild herds of sheep, cattle, asses and goats, and also of camels and horses, the two animals destined to play a great part in later social evolution.

The early inhabitants of these grasslands doubtless included considerable numbers of very long headed types, with dilution of skin-colouring from dwelling in a cool climate having, no doubt, much cloud and rain. They would also show long continuation of growth, another feature associated with cool, moist but not too

India, on the one hand, and the Baltic peoples or fair 'Nordics' on the other. In the latter the bleaching process has been continued and emphasised; in the former perhaps some fresh bronzing has occurred in India, or intermixture with older inhabitants of the country may have contributed to the prevalent skin-colouring.

Those people who spread first into the Asiatic grasslands probably had not yet done much cultivation. They no doubt



HOW MAN HAS DEALT WITH THE HORSE

A very great stimulus to Man's advance was the domestication of the horse, of which the only genuinely wild stock now existing is Przewalsky's horse (upper picture), found in Mongolia. From ancient strains such as this all varieties of modern steed from draught horse (below) to race horse have been bred.

extreme climates. We have a good deal of evidence for the spread from the borders, at any rate, of this grassland, in later ages, of types which were very long headed, rather, or even very, fair skinned and quite tall with strongly marked features. These are the Indo-Afghans, or Indo-Aryans, the members of the high castes of north-west

followed the great herds and gradually acquired some control of them, probably at first of the cattle, which belonged mostly to the parkland edges of the steppes. It was only with experience and consequent growth of confidence that these people can have dared to cut loose from their moorings, and to launch out on a purely nomad life on the immense sea of grass. Here, as in south-western Asia, the societies of herdsmen organized themselves as patriarchal tribes with claims upon belts of land for their wanderings, but probably they had less intercourse with settled folk than

had the herders in the dry lands of the south-west. Cultivation must have spread quite early into the riverine areas of the West Asiatic grasslands.

Gradually the men of these grasslands came to command the camel and ultimately the horse, and with these admirable carriers they enormously increased their

range of movement and their power over their herds. Moreover, mare's milk is a peculiarly valuable food. The camel was apparently introduced from the north-east into south-western Asia in the third millennium B.C., and thence it eventually got down into Egypt. The horse came into Mesopotamia in the later part of that millennium, so far as is at present known, and it was a companion of the Aryan conquerors of India. The Nordic race in Europe, too, is traditionally associated with the horse.

In studying both the early home zone of modern man and the west Asiatic grasslands we must remember that with

the final stages of the retreat of the ice sheets their climate, like that of Europe, changed, but

changed in a different direction. In Europe a forest, first of pine and then of oak, spread over what had been cold grassland, the climate becoming softer. In the supposed early home zone, and in the great grasslands, the rain-bearing winds penetrated less and less and the desert spread.

Doubtless the desert spread quickly in the Sahara, and fairly quickly in Arabia, though the latter was largely highland between the Mediterranean and Arabian seas, and may have continued to receive some rain for a considerable time. It spread less quickly in the Trans-Caspian region of western Asia, where there were immense stores of water from melting snow and ice on the surrounding mountain ranges; but towards the beginning of the Christian era these stores diminished rapidly and, even before that, occasional successions of bad seasons must have led the grasslanders to push their way out now and then because of the threat of famine.

Huntington has gone much farther than this, and has claimed that there have been cycles of climate with wetter and drier phases alternating, and he has supposed that successive wet phases were less wet than their predecessors. This view has some support, but is widely disputed, and the full discussion of it lies beyond our scope. The outward pressure from the grasslands of the Trans-Caspian

region at any rate provided one of the greatest motive powers in history, whether we study China, or India, or south-western Asia, or Europe. The strife between the dwellers in 'Afrasiab's tents' and the cities of Seistan and south-western Asia is famed in legend as the conflict between Turan and Iran, darkness and light.

The drying of the Sahara and Arabia, too, was a powerful incentive to the development of riverine life with its schemes of food-production, concentration of population and irrigation near Euphrates and Nile, and the general drying helped to push men out and to spread the arts. But before we take up the study of the spread of food-production and its influence on societies we must deal again with the question of the races of Man.

In the early home zone the first types of modern man, as we have seen, were typically very long headed and narrow headed; on the fringes of that zone this lengthening was probably less marked; on the southern flank, at least, men usually retained the deep colouring

of their animal ancestors and developed as a specialisation spirally

curved hair on the head. The earliest out-wanderers from this zone, pressed upon by later migrants, have found refuges either in the far corners of the earth or in unfavourable environments. They still live for the most part by hunting and gathering, but in many cases their social organization shows the influence upon them of the food-growers.

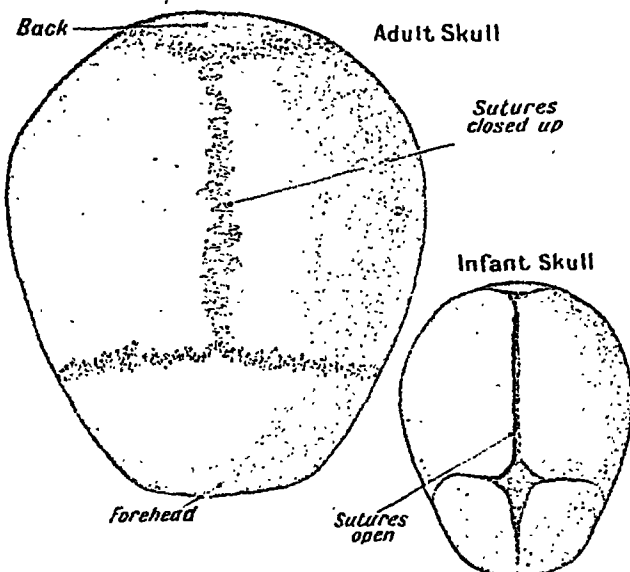
As survivors of these earliest out-wanderers we have considered the pygmies of south-eastern Asia and its archipelago and of equatorial Africa, the Bushmen of South-West Africa, the Australians and the inhabitants of various far corners in America; though in the last case we must be careful not to suppose that they are a race distinct from the other Americans—they are merely the earliest, and so the farthest spread, of a series of waves.

What was happening in the meantime in the early home zone with its very long heads and its fringing people with less lengthened heads, probably on the northern fringe in Anatolia as well as on the southern fringe already discussed? As progress

developed, and especially as more soft food for infants became available before or along with the rise of food-production, growth along most of the skull-sutures could continue longer after birth, and so growth in both breadth and length of the head became possible while growth of the jaws and teeth was reduced. Thus evolved the more ordinary long-heads, moderately rather than extremely long headed, and also the medium broad headed types on the northern fringe of the early home zone, especially in Anatolia.

The ordinary long headed types became characteristic of many regions after the final stage of the great glacial retreat, a proportion of the older, extreme long-heads surviving side by side with them. The extreme long-heads continued, for a long time after the final glacial retreat, to be characteristic of Britain which, by this time, had become an island, and they were apparently numerous for a long time on the grasslands of western Asia.

Broad headed men, that is men with large, broad heads distinct from the small, medium to broad heads of the pygmies, evolved in or not far from Anatolia and spread thence, but more slowly than the types with moderately long heads. The highlands are their main zone, but broad-headedness has spread thence down to the plains; partly because marriages between long-heads and broad-heads seem to spread the latter more than the former inheritance, partly because, since food-production has been the mainstay of life, there has been much more migration from mountain to plain than from plain to mountain. The apparent biological dominance of broad-headedness over long-headedness in certain circumstances may help to interpret the fact that in West Central Asia there are many broad headed types with facial features not unlike those of long headed men.



THE SUTURES AND SKULL GROWTH

The joins, or 'sutures,' of the skull are open at birth. When early types of modern men gained increased brain-content, the skull grew mainly at the cross sutures and so became very long; the longitudinal suture seems to have closed early to give firmness to strong jaw muscles. Later, with more soft food, the skull could grow at all the sutures; hence a broader headed type.

Let us now see in more detail how the considerations here alleged help us to understand the types of man in various regions. African peoples have already been mentioned because, among them, the survivals of early elements are considerable. Among the Bantu, however, and more still among several Sudanese peoples, there are elements of what have just been called the more ordinary moderately long headed types. All have dark skins, and though noses, lips and to some extent hair vary, they all more or less approach the type previously discussed for Africa. The majority also have rather projecting jaws, another indication of the importance of early elements. They have dense bones. Their mental development is said to close earlier than that of some other races.

In south-western Asia and the Mediterranean lands, except the Balkan peninsula, the ordinary long-head, with a proportion of the earlier extreme long-head, is the characteristic type, red-brown skinned in many parts of North Africa and Arabia and the Fertile Crescent, but rather olive skinned around the western Medi-



MODERN ANATOLIAN COMPARED WITH HIS HITTITE PREDECESSOR

The broad headed peoples in their purest form occupy a block in the centre of the Old World, with important extensions along the highland zone into Europe. In Anatolia and the Balkans their skulls exhibit a peculiar heightening, pyramid-wise, together with a remarkable development of the nose; and that this is a very ancient feature of the region is shown by the occurrence of almost identical features on Hittite monuments, such as this deity (right) from Senjirli.

Hittite head after von Luschan, courtesy of Royal Anthropological Institute

terranean and in the Aegean. The people of the Arabian desert and its fringes often have better developed profiles than some of the north Africans, especially noses; and the term Semite, which is really a linguistic one, has been rather indiscriminately used for them.

Elliot Smith's name, 'The Brown Race,' is a useful one for the long-heads of the Mediterranean, North Africa and Arabia. Their distribution suggests that they reached south-western Europe across land bridges formerly existing between Tunis and Sicily and across the straits of Gibraltar. Among the Berbers of the Atlas mountains there are and, to judge from the Egyptian monuments, there have long been fairer elements, with light hair and blue or grey eyes, but dark brown or black hair and brown eyes are normal throughout the whole race.

In Anatolia and its mountain connexions in Europe, that is, in the Balkan peninsula, the Carpathian ring; the Alps and adjacent hill masses on the north, the central plateau of France and the northern

Pyrenees, broad headed men are most typical. They are mostly white skinned with rather dry, stiff hair in some regions. The hair and eyes are usually fairly dark, but intermixture with blonde migrants from farther north has produced a good deal of fair colouring, for example in North Italy.

The broad-heads of the central plateau of France, the western and central Alps and parts of the Carpathians mostly have very rounded heads, and these also abound in the central districts of the Balkan peninsula; but in parts of the south-eastern Alps, the Dinaric mountains of the Balkan peninsula and Anatolia the type is somewhat different. Here we find a sort of pyramidal head, very short, broad and high, and often associated with this there is a tremendous development of the nose, so that the Beloved in the Song of Songs tells of her lover's nose that it is 'as the tower of Lebanon that looketh toward Damascus.'

This has led to the use of the terms Alpine Race for the more westerly broad-



Zulu Warrior



Swazi Woman



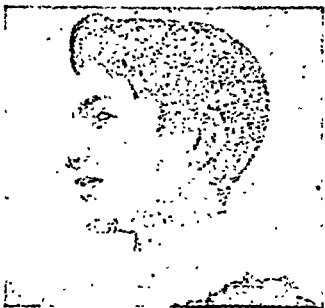
Sudanese (Bisharin)



Berber (North Africa)



Arab (Hejaz)



Sicilian



Dinaric (Croatia)



Alpine (Austria)



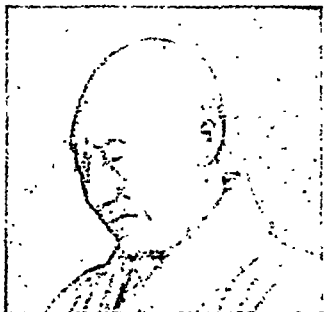
North Italian



Pamirian



Mongolian (Orochon)



Chinese

HOW THE RACES OF THE MODERN WORLD GRADE INTO ONE ANOTHER

Here the first two rows are types of moderate long-heads, the second two of broad-heads. The Swazi woman is wearing a tall head-dress, but the shortness of her skull compared with the extreme length in most negroes is evident. The North Italian shows blondeness by reason of Nordic admixture. Notice also that the Chinese are not typical Mongolians; the survival of earlier strains has produced a skull that is comparatively long, and the features are less flat.



MONGOLIAN EYELID-FOLD

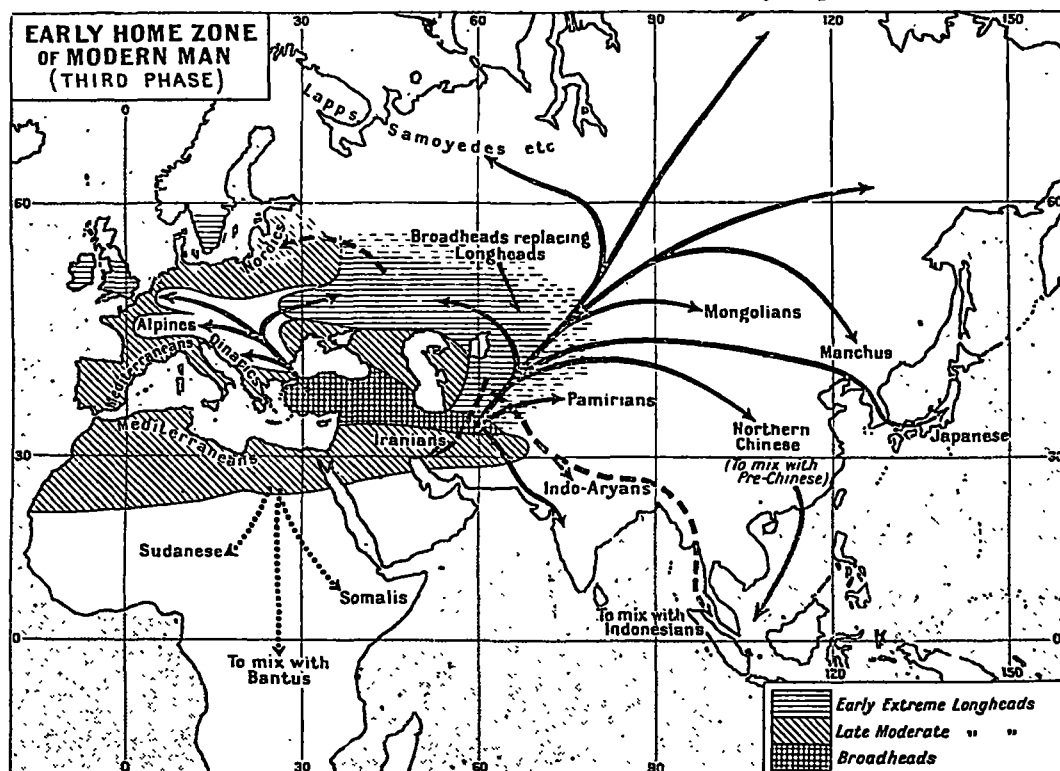
A projecting fold of the upper eyelid, well seen in this old fisherman of Chusan Island, is a feature often encountered among the Mongolian broad-heads of the Asiatic highlands.

heads and Anatolian Race, or Dinaric Race, in Europe, for the people with pyramidal heads and strong profiles—people who have obviously long inhabited Anatolia, for we get their type splendidly figured on Hittite monuments. The term Alpine is, however, open to criticism because a very similar type is found in the Pamirs, and this again is connected with many of the broad headed peoples who now occupy the west Asiatic grasslands. The names Pamirian for the mountaineers

and Turki for the plainsmen are often used. The flat-featured broad-heads to be mentioned next also occur on the west Asiatic plains.

The great central highland-plateaux of Asia must long have presented special difficulties to modern types of Man; and while in early days the ordinary long-heads, following the extreme long-heads, skirted them and turned south as they neared the eastern shores, it was the broad-heads who were the real occupiers of the high plateaux. The human frame adapted itself to this region partly by skin modifications. The dry layers are numerous and help to diminish the loss of heat; the blood vessels have sunk into the deeper parts of the skin, the skin pores are reduced and there is thus naturally little body hair; the head hair is straight, round in section and coarse so as to fill the firm pores.

Among these peoples the chewing muscles seem very important, and beneath



HOW THE HIGHLAND REGIONS OF THE WORLD WERE COLONISED

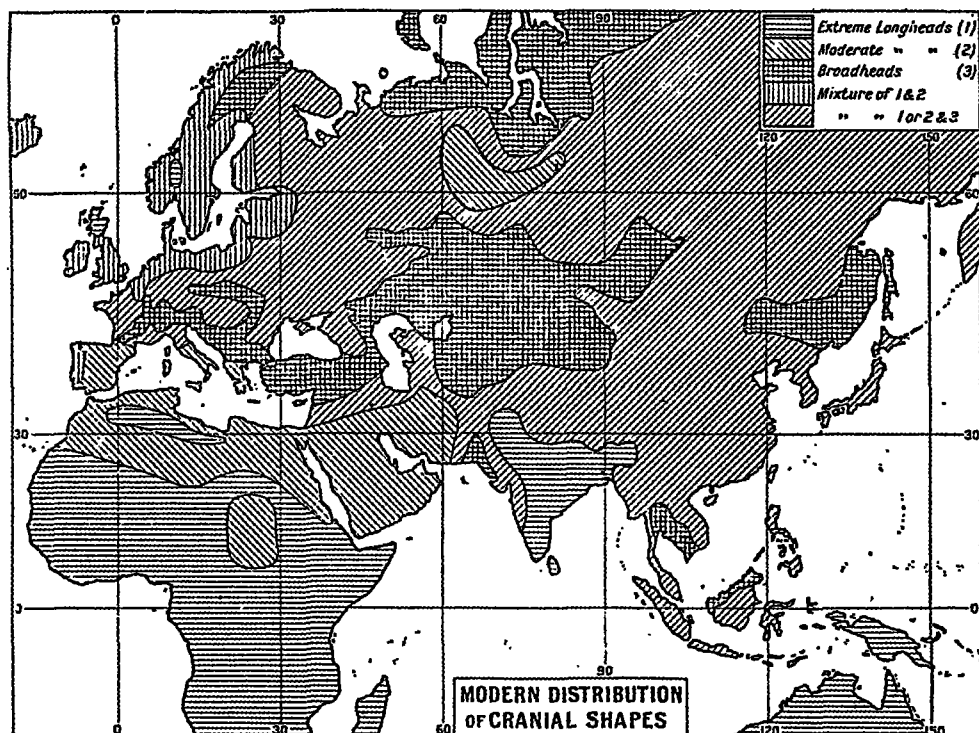
After the early, extremely long headed peoples had made themselves characteristic of as much of Europe as was suitable for their hunting mode of life, they were gradually superseded by agriculturists and forest-dwellers whose diet permitted a less exaggerated lengthening of the skull. The extremely broad headed folk seem to have been uplanders who spread east and west from the mountain knot of Anatolia (see solid black arrows), colonising the hitherto unpopulated highlands.

the eyes the cheek bones, to which these muscles are attached, have grown long and flat, while the nasal bones have also grown rather flat and the space for the nasal chambers has sunk into the skull. Together with this flattening of the cheek bones and the nasal bones there grew the peculiar fold of the upper eyelid. Once it appeared it may well have become of great value in a region with much glare from the snow as well as from the sun. Yet the eyelid fold is a very variable feature and it is observed that not all the peoples of the central highland have either it or the flattened features.

The name Mongolian has come into use for the peoples of the central Asiatic highland who have broad, low heads, yellow or yellow-brown skins, straight, coarse, black head hair and very little body hair, flattened features and the fold of the upper eyelid; but the name Tungus is now being applied in its place. No name is free from difficulty.

On this view of the peoples of the eastern plateau-centre, the Chinese, being situated beyond them, would represent a portion of the eastward human drift with broad-headedness less highly developed than in its great centre of expression on the arid plateaux. They retain the density of skin to a considerable extent, without much of the brown colour in the north, and they are thus often yellowish-white in colouring. Flattening of facial features and folding of the eyelid are frequent but variable. The Japanese, farther away from the broad headed centre and showing more influence of earlier drifts (Ainu, etc.), as well as of drifts from the East Indies, are varied in race type.

Looking next towards America we can now appreciate the more or less continuous series of waves reaching that continent; beginning with extreme long-heads, proceeding with ordinary long-heads and ultimately including broad-heads, some with prominent and some



PATCHWORK OF RACES IN WHICH THE HUMAN DRIFT HAS RESULTED

If the shape of the skull be taken as an index of race, it will be seen from this map how complicated are racial problems. In Europe particularly the separate stocks—Nordic long-heads, Alpine broad-heads and Mediterranean medium-heads—are inextricably confused; hardly a pure strain exists, and even where rough lines of demarcation can be indicated they scarcely ever coincide with national boundaries. A mixture of broad and long heads usually gives a definitely broad headed result.

with flattened profiles. Some of the native people of America are yellow or yellow-brown in skin, most have rather straight coarse hair, but a few only have the extra fold of the upper eyelid. In some the skin is almost European, albeit a little thicker; in others there is a reddish tinge in the brown, as the misleading term Red Indian implies. In some the hair is wavy rather than straight, and it is then naturally less coarse.

Returning now to the Old World, we find that long-heads, both the more extreme and the more ordinary, spread along the European loess in early times, probably in both directions, and became a feature of the Baltic shores; there bleaching of skin and hair has gone to extremes and we have the tall, fair, blue-eyed Nordic with remnants of ancient extreme long-heads of darker tint here and there. Britain, between the Nordic area of the Baltic Sea and the Mediterranean area of south-western Europe, has a large long-headed element which is naturally neither so fair as the former nor so dark as the latter, but these islands received early as well as later immigrants from both sides.

Along the European plain from the Straits of Dover to the Beresina there seem to have arisen interesting combinations of the types of Nordic and so-called Alpine peoples; but into these we cannot enter here beyond a mere statement that the broad head of the latter often appears to combine with the fair colouring of the former. The oak forest of Muscovy or Central Russia also shows a 'combined type,' but in it the Alpine element is most conspicuous.

In the pine forest of northern Europe, and on the Arctic Tundra, Asiatic broad-headed types, usually with red-brown skin and rather flattened features, are highly characteristic as Lapps and Samoyedes. The Finns grade between them and the Nordic type for the most part.

If, as our final effort in this section, we survey India, south-eastern Asia and the Pacific, remembering the earlier elements already noticed, we find that India has extreme long-heads mostly in the south and hilly centre, ordinary long-heads

usually with dark skins and broad noses on the Deccan; broad-heads along the northern hill zone, and the conquerors from the grasslands. (see page 225)—tall, rather fair, very long-headed and very narrow nosed—on the northern plain, especially towards the west. There are also broad-headed invaders in the west.

Farther India, being a land of debouchment of great corridors from the central Asiatic highland, is much influenced by Mongolian types, but in the Malay peninsula and in the East Indian Archipelago one finds comminglings of Mongolian types with long-headed types akin to those of India. The land masses here were formerly larger and the land connexions closer than they now are. The high-caste Indian type is hardly found in the Archipelago, but it reappears again away in the Pacific, and it is probable that fevers and damp heat are largely responsible for its rarity in the East Indies. The Polynesian type as seen in the Maori and the Hawaiians is in some ways akin to a rather high-caste Hindu, but there are also traces of Mongolian character.

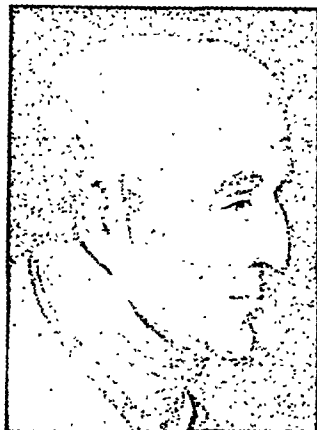
Having now reviewed the main facts of the spread of human types we can see how difficult it is to divide men satisfactorily into races to which definite names can be given. It is obvious that, in the modern populations of the Old World, Pygmies, Australians, Africans, Mongolians, the Brown Race of the Mediterranean lands and south-western

Asia, the so-called Alpines **Seven chief Races of the World** and similar types in Asia

(the Anatolians and their Dinaric congeners) and the Nordics of the Baltic area stand out as the most distinctive results of the adaptation of migrants to the climates and circumstances of various lands. But these are only the outstanding points in a continuous series; each grades into the others and sharp divisions are nearly always misleading, though they can be made here and there.

We must now turn to see how human communities have developed in the various regions under the influence of the inventions and drifts of the food-producers.

The great mass of African societies has passed into the phase of food-production; in some cases with the emphasis more on



WELL KNOWN FEATURES THAT ILLUSTRATE DIVERGENCES OF RACE

It adds to the interest of anthropological studies when one can take famous men, rather than Man in the mass, and subject them to classification. Thus, reading from left to right, we may select (top) King Prempeh of Ashanti as Negroid ; the Dalai Lama of Tibet, Mongolian ; Raphael, Mediterranean ; and (bottom) Wellington, Nordic ; Kant, Alpine ; Darwin, Nordic and Alpine mixed.

cultivation, in others more on herding. Neither sheep, nor ass, nor horse, nor camel is at home in intertropical Africa, and cattle, poultry and goats are thus the chief domestic animals, though sheep of a kind are kept in some parts. The people grow millets and various other rather inferior grains ; manioc and maize have reached Africa since the discovery of America by Europeans, and most African cultivated food plants have come in from outside. Communal hunting of buffalo and elephant is often carried on, especially by the more pastoral peoples.

The climates of intertropical Africa are one and all rather trying to the human frame. In spite of his moist, supple, hairless skin, often richly supplied with blood vessels, in spite of the large open nose and the everted lips, the widely and loosely

open sweat pores and many other details, it is difficult for the native to get rid of enough heat to allow him to do hard work or hard thought. Great heat promotes quick completion of the cycle of growth so that in pure native stock the development of brain-power after the age of eleven or twelve is small.

We must picture people, then, working under heavy disadvantages, acquiring fragments of the arts and social ideas of the food producers of Mesopotamia and the Nile, and acquiring them mainly via the Nile. It is a melancholy fact that one of the most general features of human society is the exploitation of the under dog, and nowhere has that been more marked than in Africa, where conquest has again and again forced people to do the hard work of cultivation for others

who formed a military aristocracy, though, in intertropical Africa, society has not developed sufficient means of organization and expression to give great permanence to established dominion.

Buildings are of clay or wattle-and-daub, or of wood, rather than of stone; and attacks of insects, accumulations of refuse, overgrowth by fungi and other plants often make it desirable for the group to change its location. In many regions the villages are far from permanent. There is rarely the regular deposition of fertilising silt that is such a feature of the Nile, and the soil thus becomes impoverished after a few years, especially where manioc is grown, so that there is a direct economic reason for shifting among some cultivators; while the herdsmen naturally move to pastures new from time to time if they can. In south-western Asia and Egypt the light plough, often drawn by ass or camel or both, helps fertility; the plough has taken no hold in intertropical Africa, where digging stick and hoe are the typical tools.

Insect-borne diseases affecting cattle are rampant, especially in forest areas which can be cleared for cultivation, and large scale organizations of combined herding and planting are not common.

Among the higher Bantu peoples, smiths and carvers, weavers of basketry and of bark cloth, leather workers and potters are to be found, and work on a large scale is often attempted and carried through; nevertheless the indigenous communities of intertropical Africa have remained on a lower level than those of the great river-lands of antiquity. Typically, a group will clear a patch of bush or forest for cultivation and the building of a village, the cleared land will be held usually to belong to the leader as the representative of the group, and the individual will have a right to use a share of it. The idea of sale of land is foreign to this region, and this fact has led to many deplorable accidents in the relations between African communities and European traders.

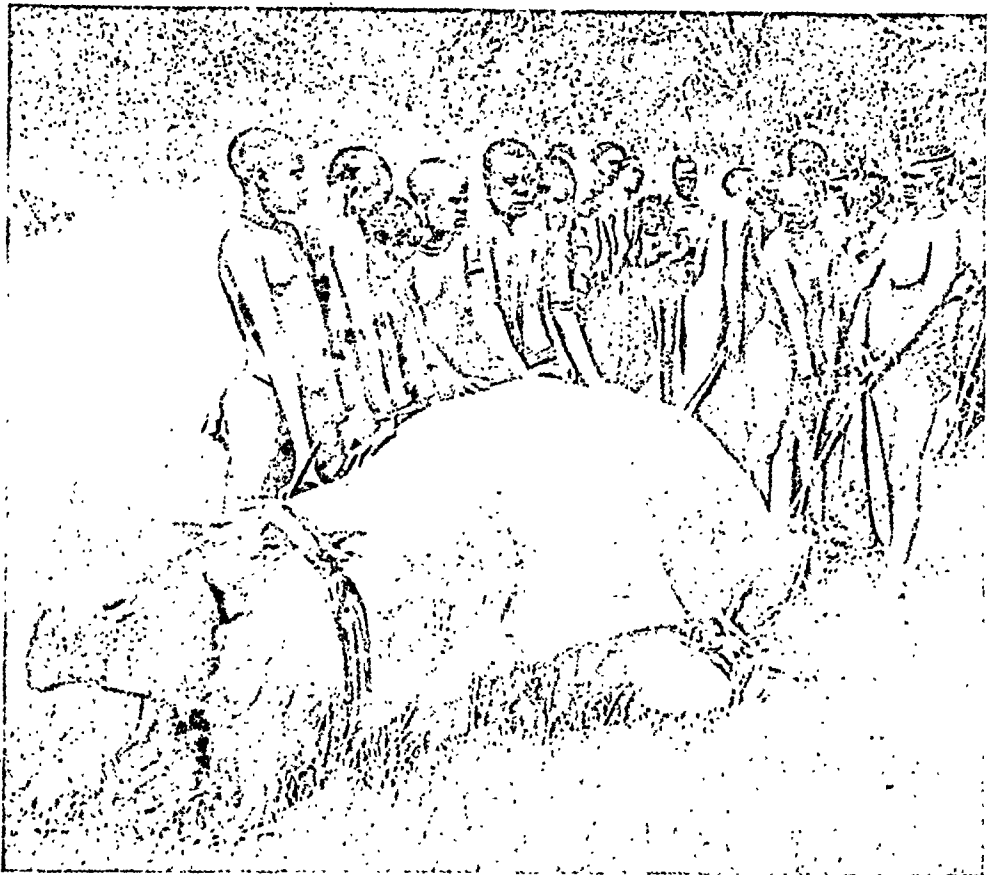
In some regions, after a few years' residence in a village on a cleared patch, the factors above mentioned make the village deteriorate, so another patch is cleared and a fresh village is built and the cycle starts once more. Unfortunately the great wet equatorial forests, being the result of ages of growth and adjustment, do not easily re-establish themselves in their original form over cleared patches; a



HOW PASTORAL AFRICA LIVES: GRASS-BUILT HUTS OF A NIGERIAN VILLAGE

In intertropical Africa most villages are so impermanent that they hardly deserve the name. The soil is quickly impoverished and the settlements themselves soon become uninhabitable by reason of accumulated refuse, so that it is imperative to move to another site. Only the partly pastoral communities, such as those on the Nigerian grasslands, build settlements as permanent as this.

Photo, W. S. Boreham



WILLING CO-OPERATION BRINGS HOME A KAVIRONDO MEAL

Communal hunting is practised widely throughout tropical Africa, the whole tribe co-operating in the 'drive' just as we may be sure that the custom was in palaeolithic Europe. Among the Kavirondo tribes of British East Africa the women take almost as active a part as the men; they are here dragging home a speared hippopotamus. For elephants and other big game traps are used.

poorer vegetation takes their place and there is started a process of widespread deterioration, which has been specially well described in Perrier de la Bathie's book entitled *La Flore Malgache*.

Towards the northern tropic, villages are larger and more permanent, and herding societies have more of a patriarchal or regnal organization. Some places have huts for over two hundred thousand people gathered together, including what might be called temples and palaces; but these developments and any other germs of the city are generally to be ascribed to the influence of fairly recent invaders from farther north. For centuries, moreover, African life has suffered the blight of the slave trade on a large scale, and it may be that many a downgrade tendency is to be ascribed to this.

Practices and beliefs differ markedly in different parts of intertropical Africa, and it is difficult to make statements of wide general value. Fetishes are important; they are often objects of artificial character, and of such a size as to be portable. The fetish is supposed to have an indwelling power which may be conceived in the form of a spirit. Sacrifices, often human, are offered to the fetish or to other spirits, and the places and rites of sacrifice may be in the charge of priests who represent a stage of organization somewhat beyond that of the magician or medicine man of the hunting peoples previously considered. The gods are often conceived in human form.

Among some Bantu peoples there is a regular kingship with a form of hereditary succession, and with this often goes a

centralised government. The people includes several 'clans' which may own large tracts of land; the land not owned by a clan is typically the property of the king. Land on which a clan has buried its dead for some time may become its permanent property, and this custom perhaps sheds light on the possible importance of prehistoric burial barrows in Europe and elsewhere. The kings may have subject-chiefs and a whole array of administrative officials as well as a large household staff.

These features distinguish the societies of intertropical Africa from those of the hunting-peoples; but in spite of their organization they are on a much lower level than those of Mesopotamian or

Egyptian antiquity. Writing is almost if not quite unknown; recited histories are at best far less developed; astronomical knowledge and calendar schemes are poor.

In some regions a lack of permanence of society has led again and again to the gathering of a band of warriors around a leader of prowess, so that numbers of social groups are military hordes rather than tribes, and are therefore apt to break up when defeat occurs. The defeated peoples have often been driven into belts of tsetse fly, and have had to give up their cattle and rely more on cultivation, though in some cases efforts are made to keep a herd of cattle for the king.

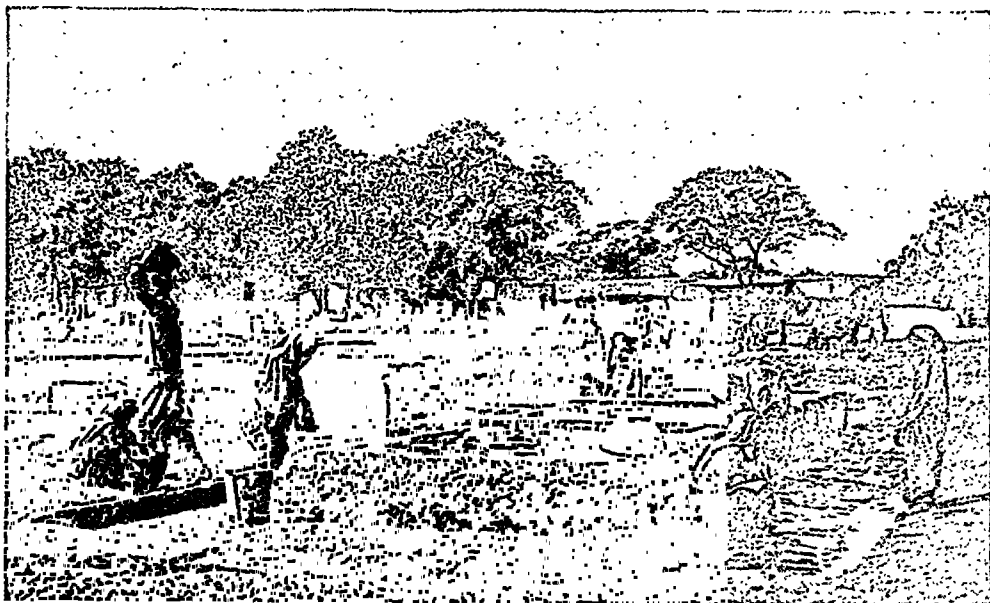
The full apparatus of the early food producers reached India in far-off times



MAKING BY HAND THE OBJECTS OF AFRICAN WORSHIP

Among the welter of beliefs that are to be found in Africa, fetish-worship seems to be fairly characteristic. It involves the idea of a power (rather than a personal 'spirit') residing in an object that is often quite artificial. This Dahomey native, for instance, is making a clay image for presentation to his medicine-man and incising the surface with the beak of a dead fowl, as part of the ritual.

Photo, J. R. Rihwistle



WHY INDIA IS A LAND OF 750,000 VILLAGES: SCENE NEAR AHMADNAGAR

While India to-day has many large cities, some of them among the most populous in the world, it is still pre-eminently the land of villages. Their number has been reckoned at 750,000. This is the result of food production introduced into a territory whose climate allows body and soul to be kept together on a meagre diet, thus dispensing with the need for co-operation on a wider scale. Each village leads a somewhat communal life, as suggested by these women scouring pots at the local tank.

Photo, H. H. Roskin

and many villages and cities grew up; it has been said that there are 750,000 villages in India to-day. The village traditionally held and used its lands, often under a local leader or lord, and largely managed its own affairs and its local rites in honour of its own deities.

Military chiefs and priests are a traditional feature of Indian society, and here, too, introspective philosophy has developed remarkably. Men have devoted their whole lives to thought, and have thus made a place for 'saints' in social life, some acquiring renown over wide areas and freeing themselves from local bonds to rise to a concept of the Universal Spirit. The comparatively small amount of simple food needed for bare existence in such a land as India has its bearing on this tendency.

The effect on India of its Indo-Aryan conquerors, supposedly of the second millennium B.C., appears to have been tremendous. Within the great mountain frame that encloses India these conquerors found a region of grass on which their traditional life could be maintained, no doubt with modifications for a much warmer climate.

Their worship of the horse and the royal privilege of sacrificing horses are significant. Beyond them in the Ganges basin and in the hills of central India lay wild forest, and there were at hand conquered peoples to be used in the work of forest-clearing.

The conquerors treasured their traditions and strove to keep themselves apart from the cultivators, and, still more, from the wild tribes of the hills. Indian tales speak of the kingdoms they founded in the Upper Ganges basin and of their aloofness from the conquered peoples, and it is in this that we perceive one of the many germs of the caste-system. On the one hand are the Brahmin or priestly, and the Kshatriya or soldier caste; on the other the Vaisya or peasantry, and the Sudra or labourers; in course of time many occupational and other groups arose, and finally the Pariah, outside the pale of society. It is said that the caste-system attains its most complex development in the region now called the United Provinces, the historic region of the old kingdoms and the royal cities.

We may look upon this system as an expression of an effort to provide for the

maintenance of cultural heritages. And, on the whole, it has been a successful one, at any rate until modern European influences began to work in many directions, bringing about changes in the concept of land ownership, increase of population on a huge scale and industrialisation.

Turning next to China, we find again indications of an advance of food-producers, with most of the accompanying cultural heritage, from the interior of Asia, at a date which is far from certain but was probably in the third millennium before Christ. Society was here built on lines rather different from those characteristic of India. The advance apparently occurred chiefly through Kansu and the Wei-ho valley along belts of loess, which gave an inexhaustible supply of fertiliser, down to the flood plain of the Hwang-ho with its rich mud derived ultimately from denudation of the loess.

Here, once the Wei-ho was reached, conditions enforced cultivation rather than herding as the basis of life; the conquerors from the interior had to devote themselves to the organization of terracing and irrigation—had to become administrators—and so were not able to maintain their distinctness to anything like the

extent which seems to have been possible in India. The weakness of the caste distinctions in China is as characteristic as their strength in India.

Among the Chinese cultivators, using terracing and irrigation, co-operation of a certain number of workers seems to have been found generally desirable, and the group based on kinship maintained itself. Thus the 'large household' became the typical unit, involving co-operation, community of property and the duty of mutual protection. How far this unit is simply a metamorphosis of the tribal unit of the interior, and how far it may be a special development, this is not the place to discuss. The former interpretation has in its favour the fact that a somewhat analogous 'large household' has been, and to some extent remains, a typical social form in parts of the Balkan peninsula, in which social evolution towards western European standards was held back by Turkish domination. It is not to be too sharply distinguished from the familial groups which exist under the caste system in India.

The growth of large cities, with expressions of corporate life in architecture and the arts, notably of course that of the potter, is a great feature of the food-



FAMILY LABOUR: THINNING OUT RICE IN A SOUTH CHINA PADDY FIELD

In a rice-growing region, such as South China, the terracing, the flooding of the paddy fields to cover the young shoots, the thinning-out as these become too closely matted together, and the vital irrigation throughout the rest of the year—all demand co-operation. Hence we find that the 'large family,' embracing relatives at all stages of distance, is the traditional social unit.

producing civilization in its adaptation to China. Another feature is the marked subordination of stock-rearing to cultivation, a fact not unrelated to the crowding of population and to the general tendency to pacific endurance rather than warlike adventure. The deep difference between digging in North China and under torrid conditions in India should be noted. Density of settlement and continuity of hard work has led men's thoughts towards problems of practical conduct, and it is these that have specially occupied the great minds of China. (For China and India see further under Chap. 14.)

We see then that the food-producing idea, with its cultural accompaniments and social organization, originating in the fifth millennium or earlier among the riverine lands of south-western Asia and Egypt, seems to have spread to India, China and the Mediterranean by the third millennium, and during that and the succeeding one received many additions through the influence of the peoples pushing out from interior Asia. These regions, and regions beyond them, became in varying degrees lands of cities and villages with different forms of communities and social organization.

We have noted that the spread of the same culture and social scheme to Africa south of the Sahara was but fragmentary

owing to several kinds of difficulties, and inter-tropical Africa cannot lay claim either to an ancient

Backwardness of Torrid Africa or to a modern civilization of large general value. It has produced social organizations adapted to a difficult environment, which seems to have effectively held back the people from an evolution corresponding to that of Mesopotamia and Egypt, the Mediterranean, India and China. It is noteworthy that, in most of these cases of early city-development based primarily on food-production by cultivation, we are dealing with regions where silt or loess provided fertilising material, where irrigation and other arrangements for adequate and regular water-supply were possible, and where the climate involved a regular succession of seasons, with hot sunshine following moisture (whether from rain or from river-flood).

Attention might also be given to communities in America, Japan, south-eastern Asia, Melanesia and Polynesia, but it is advisable to turn rather to Europe, which presents us with a singular problem. It shows, like intertropical Africa, a rather fragmentary penetration in early times of the idea of food-production by cultivation, and, again like intertropical Africa, an absence of city-development and learned traditions in far-off antiquity. But Europe contrasts with Africa in that those developments did ultimately occur, and became in the end at least as full as they have been anywhere else.

In an earlier part of this chapter we left the communities of western and north-western Europe suffering depression and poverty under the influence of the spread of inhospitable pine-forests after the final retreat of the ice. It is true that forests of ash and oak and beech succeeded the earlier ones of pine, and that the climate of the temperate forest of deciduous trees is the one which best suits humanity; but for all this Europe did not find herself able to develop of herself a great civilization.

There have been suggestions, by Kosinna and others, that the peoples around the south and western sides of the Baltic Sea made a fresh start and were responsible for many developments, but investigation tends to suggest that the real spurt came from south-western Asia in the third millennium B.C., however early that new dawn may have affected the Baltic, which became a centre of attraction because of its amber. Childe, in *The Dawn of European Civilization*, has shown what a great part the loess soils of the Danubian region played in the awakening of Europe to food-production (see Chap. 30); but at the same time trade was spreading in the Mediterranean basin and Crete and Troy were rising into prominence. Menghin has recently suggested that there was possibly some continuity of tradition stretching from the hunter-artists of Moravia to the peasant cultivators of later times, but here we are concerned less with archaeological sequences than with community life.

The difficulties in the development of food-producing groups in Europe north of

the Mediterranean were many and could be overcome only step by step. The climate was less regular than in south-western Asia; forest, save on loess and limestone, was dense and difficult to clear; soils, save parts of the loess, were much more liable to exhaustion than those fertilised by river silt of Euphrates and Nile, and the cereals

Agriculture advanced by degrees needed time to acclimatise themselves and to develop races of grain suited to European conditions; and finally deeper ploughing than on Euphrates and Nile banks was found necessary for success. For much more than 2,000 years after the introduction of cultivation, the food-producers of Europe north of the Mediterranean did not rise above the level of village communities.

There is little doubt that conquerors from the edge of the steppe repeatedly influenced these village cultivators of ancient Europe and contributed to their organization, and in this connexion it should be remembered that the horse and its association with the king is a feature of early Teutonic thought, as it is of early Indo-Aryan and Iranian thought as well.

An attempt has now been made to suggest what can be inferred concerning early human communities of hunters and food-gatherers, and then to picture the social changes following the grouped inventions which seem to have accompanied the rise of the great arts of food-production. Some degree of penetration of food-producing organization and inventions has affected almost every community on earth, and some of the ideas involved have grafted themselves on to older ones in Africa and even in Australia, Melanesia and elsewhere. The organizations based on food production have come to fullest fruition in Europe and Asia, but have expressed themselves less completely in Africa, where, in several parts, the military horde is a typical social formation.

There can be little doubt that, especially among small and isolated groups, in Australia, Melanesia and Polynesia for example, there has been much loss of introduced arts, or else that fragments of them only survive in half-understood forms. The danger of ideas and arts

dying out among isolated communities is widespread, for in such groups habit tends to harden into a rigid rule which decays bit by bit as its meaning becomes less clear. Intercourse on the other hand has often been a quickener of thought and a help to the maintenance of meaning in social custom; it has meant contact with other minds and other ways, the growth of powers of observation, and of an objective view of one's own life and group.

It was intercourse that finally awakened Europe from its sleep of decay after the impoverishment of the early hunter-artists, and this intercourse, linking it especially with the steppes, south-western Asia and the Mediterranean, pressed life forward step by step till Rome spread the idea of the city as far as the Rhine.

It is probable that a stimulus was given to the development of intercourse and civilization in the Mediterranean and in Europe generally by the disturbance of routes of intercommunication in the riverine lands of antiquity about 2600-2500 B.C. This disturbance may be tentatively ascribed to the introduction of the horse as a war-companion of conquering groups from Iran or farther to the north-east. The foundation of the great city called Hissarlik II, on the site near the Dardanelles later occupied by the Troy which the Greeks destroyed about 1184 B.C. (see Chap. 29), is very probably related to these disturbances.

So we may reach a conclusion, and venture the generalisation, that while society in any region is in some measure an adjustment of relations between groups of men and external conditions, yet in almost all cases, almost everywhere, it is impossible to give an adequate interpretation of a society on these lines. There must be drawn into the discussion the immense factor of intercourse, of the direct and indirect influences of human contacts. Sometimes these are so discordant with the indigenous cultures as to cause their decay, but they may be fruitful both in their immediate contributions to social equipment and even more as stimulating progress, however slow, towards the still distant goal of liberty of conscience.



NEANDERTHAL FLINT WORKERS INTERRUPTED BY THE SIGHT OF PREY BENEATH THEIR CAVE HABITATION

Man's discovery how to extend the functions of his hand and arm by the use of implements lifted him out of the ruck of other mammals. Wooden tools, probably with but little secondary adaptation for the use in view, must have preceded flint (the leader above is shown with a fire-hardened spear); but for long aeons the only thing to mark Man's progress is the slow improvement in the technique of flint-chipping. This scene, well authenticated save for irrecoverable details of hair and skin colouring, is of a Neanderthal family in the Mousterian culture phase, excited by the appearance of game in the river below their flint-chipping workshop. Not before this comparatively late period are there human remains sufficient to justify such a reconstruction.

Reconstruction by Charles R. Knight, courtesy of American Museum of Natural History

PRIMITIVE CRAFTS IN PEACE AND WAR

The Material Evidence that survives to shed Light on
the Art Adroitness and Daily Life of Prehistoric Man

By R. R. MARETT D.Sc. F.R.A.I.

Fellow of Exeter College, Oxford, and University Reader in Social Anthropology;
Author of *Psychology and Folklore*, etc.

MAN is the manipulative animal; he owes his supreme position among living creatures to his handiness.

As for the tool, it may be regarded generically as an extension of the hand. Handling things thus by deputy, Man, in the course of a long process of experiment, has discovered how vastly to increase the range of his manipulative activity; so that the mechanical achievements of modern civilization seem at first sight out of all relation to their far-off humble beginnings.

Nevertheless the study of the origins of our present immensely complex arts and crafts not only reveals the strictest continuity between them and their savage prototypes, but likewise proves that the early chapters of the romance of industry can bear equal testimony with the later to the inventive genius of our race.

Now prehistory starts from a blank. When Man first comes into view he is already in possession of a material culture implying, on the evolutionary hypothesis, a lengthy process of previous development. Probability alone can guide us in reconstructing the tool-using efforts of fossil man's unknown precursors. A few animals, and notably the apes, which in point of physical resemblance are nearest to Man, are said occasionally to fling a stone or brandish a stick when in a state of nature, and during captivity can be taught to display such accomplishments in much greater variety; though it remains doubtful how far in the one case or in the other such acts involve any full awareness of the function of the means employed.

If, then, we credit Man or his pre-human ancestor, despite his opposable thumb

and his relatively bigger brain, with an initial technical ability on a par with an ape's, we might label it the appreciative stage; since the user of the casual stick or stone at least appreciates it as somehow satisfying to his present mood. From this basis a rising scale can be constructed consisting of successive stages which may be called the selective, the adaptive and the inventive.

Thus, first, there is advance as soon as, in place of the first thing that comes to hand, a natural object is picked out as especially suitable for a given purpose. Moreover, such a tendency must soon lead to the collection and storing of a supply of ready-made appliances of the type preferred. Next follows the adaptive stage, when it is realized that what does not wholly conform

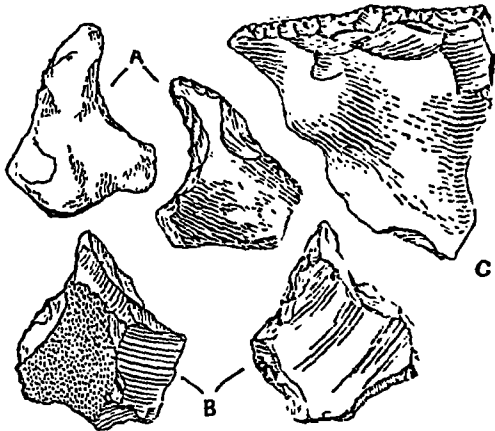
to the required pattern may nevertheless be made to do so by subjecting

Four stages of
Development

it to more or less modification. The artificial tool now makes its appearance; and it is to be noticed that there arises herewith the need for tools that will help to fashion more tools—for a hammer-stone to chip a flint knife, a flint knife to carve a wooden club, and so on. Finally, the inventive stage differs from the adaptive only in the degree in which nature's provision becomes subordinate to Man's design—in other words, comes into being at whatever point the suggestion of the form can no longer be said to be given with the matter.

Of course, Man cannot create out of nothing, and the intrinsic qualities of the material thus always, in a sense, predetermine the use to which it is put. But it is one thing to improve on a pointed

stick by sharpening it further, another thing and a cleverer to think of attaching to the end a spike of stone or bone; so that perhaps one might class all composite instruments as inventions rather than adaptations. At any rate, when for the natural operation of flinging such a sharpened stick by hand there is substituted a mechanical propulsion obtained by means of the spear-thrower or the bow, Man's constructive imagination has clearly left mere copying behind and has embarked on a course of genuine origination.



MAN'S HANDIWORK AND NATURE'S

The difficulty of the 'colithic' question may be realized by comparing these illustrations of recent Tasmanian implements (A); reputed coliths (B); and a flint admittedly chipped by natural agencies until it resembles Man's handiwork (C).

After Prof. Breuil and Reid Moir

Passing on from these theoretical considerations to a survey of the actual evidence, we clearly cannot expect many recognizable traces to be left of the appreciative or the purely selective stage. If sufficiently durable, the things doubtless survive; but how is one going to distinguish them? At most one can hope to judge by marks of use, as contrasted with those marks of design which are exhibited by the product of adaptation or invention.

Thus, more especially if they are associated with worked implements, one can pick out the natural pebbles used as hammer-stones by the abrasions visible on their striking-surfaces; or may, less certainly, argue that other pebbles found in a little heap near a hearth and showing signs of having been subjected to considerable heat were cooking-stones. Or, again, I have discovered in a cave

habitation of pre-glacial man pieces of rock crystal, jasper and so on, of remarkable appearance, that were presumably brought there because they somehow appealed to the fancy.

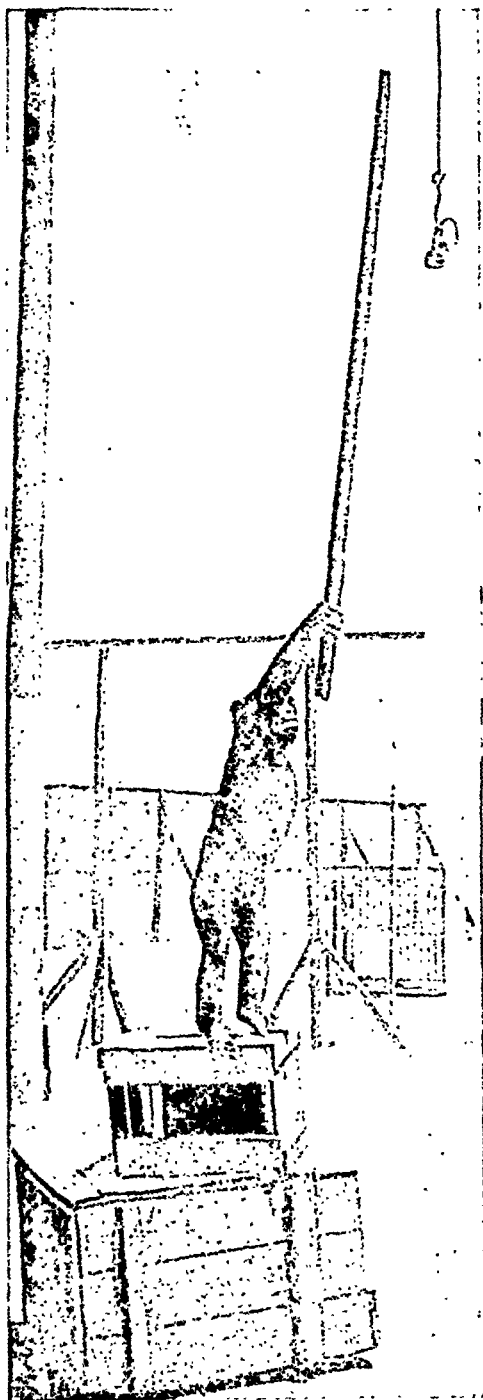
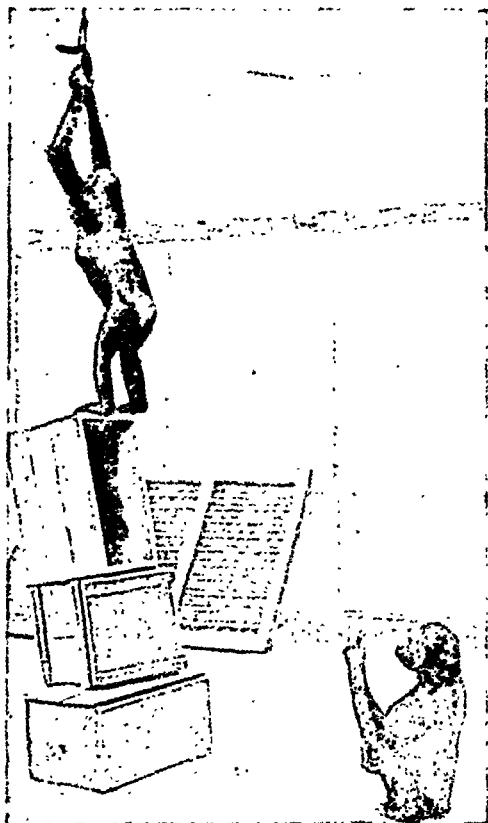
Meanwhile, the supreme test of the former presence of prehistoric man—apart from his bones, which are comparatively rare—is the evidence of workmanship. Unfortunately at the very beginning of the adaptive stage the genuine artifact is exceedingly apt to be confused with the 'pseudomorph,' nature's counterfeit, which sometimes reproduces the appearance of human fabrication with almost irresistible plausibility. Hence the vehemence of the controversy about coliths. Here it would not be in point to discuss the authenticity of these Pliocene or even pre-Pliocene specimens of alleged human handiwork, since the main point at issue is simply whether Man can thereby be connected with so remote a geological horizon (see Chap. 4).

The further question which arises as soon as their human source has been proved, namely, what special purposes they are intended to serve, has hardly been touched. A few of them might perhaps appear suitable for cutting, piercing, and so on, in a rough way, but for the most part they consist, as Professor Sollas once put it, of 'scrapers that will not scrape, borers that will not bore, and planes that will not plane.' Indeed, I once heard an ingenious defender of certain decidedly blunt and shapeless examples explain that in those far-off days Man, being a gentle vegetarian, was mostly concerned between meals with 'preening' himself, and found, I suppose, a flint rubber particularly stimulating to his skin or, rather, hide.

Without prejudice, then, to the question of the value of such evidence as demonstrating the existence of Tertiary man—and J. Reid Moir's East Anglian specimens (of which examples are seen in page 153), especially those from Foxhall, have converted many eminent authorities who before were sceptics—one may say that it throws no light at all on the state of his culture. True, certain backward savages of modern times, such as the now extinct Tasmanians, have used rude



The stick which this ape holds in his right hand is about to be pushed into the aperture at the end of the hollow cane held in his left.



ACHIEVEMENTS AND LIMITATIONS OF THE INTELLIGENT CHIMPANZEE

A chimpanzee here fits a stick into a hollow cane, to make a rod long enough to reach an objective ; another piles up boxes for the same purpose ; another combines the two methods. Now an ape will readily use a single stick : instruction is necessary for the adaptation. He will also correctly use a single box, but the accurate placing of another on top, in the first instance, seems partly chance. Nothing comparable to the adaptation and invention of tool-using Man is observed.

From Mentality of Apes by Prof. W. Köhler (Julius Springer, Berlin and Kegan Paul, London)

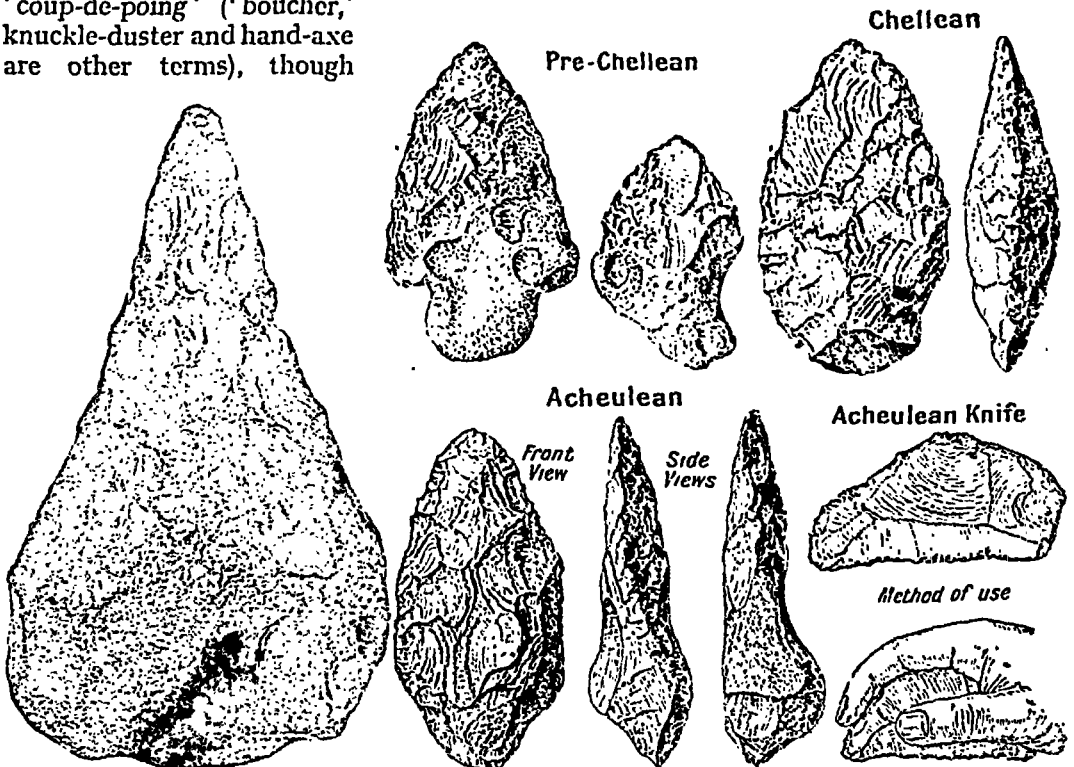
implements which, with certain instructive exceptions, could hardly by simple inspection be assigned a human origin or purpose; though we know as a fact that the natives found them highly useful for scraping spears, notching trees to make foot-holes for climbing, skinning animals, smashing marrow bones, cracking shells and what not.

But the Tasmanians had no better material at hand than a rather intractable sort of sandstone; whereas eoliths are suspiciously associated with precisely the spots where natural flints are common. In any case, since we could not divine Tasmanian habits from their rudimentary stone-work considered by itself, we are none the nearer to deducing the hypothetical eolith maker's habits from his stone-work, however like the other it may seem to be.

In the Lower Palaeolithic industries, pre-Chellean, Chellean and Acheulean, the typical implement is the so-called 'coup-de-poing' ('boucher,' knuckle-duster and hand-axe are other terms), though

sites of this age in reality yield a fair variety of other forms. Meanwhile, the coup-de-poing itself varies greatly in the course of its development, the outline being triangular, pointed, lozenge-shaped, oval or even round, while the line of the edge, at first irregular, becomes as time goes on either quite straight or gracefully sinuous.

Produced out of a flint nodule or other lump of stone, by chipping both sides until a sharp working edge results at one end and a butt comfortable for grasping at the other, this fine instrument presupposes a long apprenticeship in the art of reducing crude matter to a desired shape; such, indeed, as is scarcely reflected in our existing palaeolithic series of types, however much we draw on the eolithic series to help it out. A possible inference is that the adaptive stage was inaugurated by an age of wood, the output of which has perished. Indeed, it is in any case necessary to suppose that wooden clubs, spears



BEAUTIFUL SPECIMENS OF MAN'S EARLY EFFORTS AT TOOL MAKING

The fine Chellean coup-de-poing on the left, discovered in London beneath Gray's Inn Road in 1690, was the first palaeolithic implement to be recognized as the work of Man, though its true significance was not perceived. The examples on the right show the advance in workmanship that can be traced from pre-Chellean to Acheulean in the same characteristic early type of implement.

From British Museum and V. Comnaut, L'Anthropologie

and so forth were in use side by side with the *coup-de-poing*; which is usually thought—though it is but a guess—to have served more as a ‘general utility’ tool than as a weapon of offence, as the word ‘*coup-de-poing*’ would suggest.

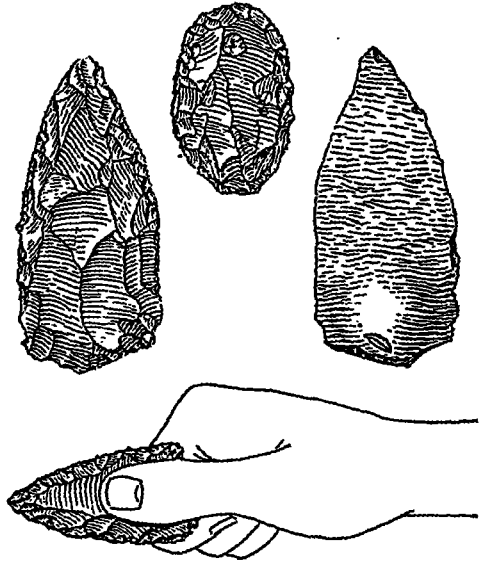
Meanwhile, whatever its function, this form of stone implement appears to have come into universal favour, so that it would even seem that in the Acheulean as compared with the preceding Chellean period there was greater concentration on this single type. For the rest, it has a very wide distribution in the Old World; and, though we cannot be sure that all the specimens belong to the same far-off age, some of them at least, notably certain South African examples, are so demonstrably ancient as to suggest that the cradle-land of the industry lies somewhere outside Europe, perhaps in South Africa itself.

Whether such implements were ever hafted is uncertain, and the term ‘hand-axe’ is not used here because it begs this question. It is extremely probable, however, that the inventive stage of uniting stone and wood in one composite tool had not yet dawned for the man of the Lower Paleolithic—any more than it had for the Tasmanian when first discovered, unless isolation had caused him to degenerate, instances of lost arts being fairly common among islanders.

As for the use of other material besides stone, nothing survives from this period in the way of worked bone except a

The Piltdown
Man's club

most remarkable instrument found in Sussex in association with the famous Piltdown skull, and certainly very ancient, since it was made out of the fresh thigh bone of a kind of elephant that preceded the mammoth. It is about 17 inches long, is shaped rather like the blade of a bat, has a chiselled edge and shows a notch on one side as if a thong had been attached to it; an illustration appears in page 152. Two bones from Taubach near Weimar, one cup-shaped, the other like a dagger, may be more doubtfully classed as artifacts of the same remote age. Doubtful also are the ‘figure-stones’ assigned to this period by Boucher de Perthes and others; they



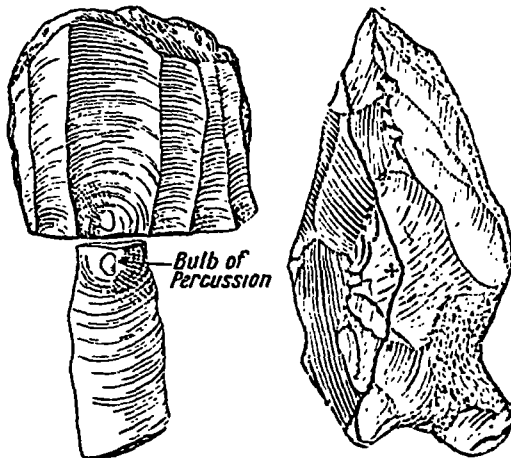
USES OF A MOUSTERIAN 'POINT'

The trimmed bases of these Mousterian 'points' probably indicate that they were grasped in the hand, as in the above illustration. It is suggested that points were implements of all work, like pocket-knives to-day. Above, a Mousterian disk.

After De Mortillet, Musée Préhistorique

are nodules which, thanks to their shape, or to chipping which may or may not be by Man, bear some resemblance to animal forms.

With the Middle Palaeolithic begins the cave period, and at once we are on intimate terms with man, being able to visit him at home, where the floor, carpeted with refuse, proves his shelter to have been also both kitchen and workshop, nay, sometimes even his place of burial as well. Brutish though Neanderthal man was in physical appearance, he must have been intelligent in his own way. In one cave of this period which I excavated I found that, of about 15,000 pieces of flint, two-thirds showed marks of use, and half of those secondary chipping with some approach to design—surely a very economic use of material. In another I looked round for a good hiding place and discovered, or, rather, was shown by a sharp-witted boy, a well screened crevice high up by the roof; this notion, it appears, had likewise occurred twenty thousand years ago to some astute individualist, since the recess concealed the finest of Mousterian ‘points,’ in fact the catch of my season.



LATER METHOD OF WORKING FLINT

Earlier workmen made tools from the cores of flint nodules; Mousterian craftsmen used flakes. Above (left) we see a nodule with a flake detached from it; and (right) an actual flake fitted into the parent nodule, which was also discovered. It will be seen that the flake was chipped *before* removal by a blow at the point x. The 'bulb of percussion' is the characteristic mark of human handiwork; it appears in the flake beneath the point of impact.

After Macalister, European Archaeology

No wonder, then, that the earliest cave-dwellers, being so sagacious, had the use of fire; without which, indeed, their caves would have been scarcely habitable in view of the rigour of the climate and the attentions of cave-bears. How they made it is suggested by the occurrence in their caves of iron pyrites, two lumps of which would provide a strike-a-light. How they used it is abundantly proved by their hearths, with adjacent bone-middens testifying to the rich stock of available game animals and to the effectiveness of their hunting methods. What these methods were, however, can hardly be deduced from the cave remains, and we can only suppose that the fashions of the age of wood persisted largely into these times; since their whole stone industry is suggestive of domestic and sedentary functions, such as cutting up the meat, or scraping the skins and boring holes in them for fastening as garments, or rounding off a stick with a hollow scraper used like a spokeshave.

The typical instrument, the so-called Mousterian 'point,' was probably a universal tool, a sort of 'sailor's knife,' just as was its predecessor, the coup-de-poing. The latter, by the way, though it survives as part of the normal equipment

only into the earlier portion of this period, may have retained a ceremonial value—just as the Neolithic axe became the sacred thunderbolt in the eyes of a later age—to judge from the fact that the man of Le Moustier was buried with a coup-de-poing in his hand, though it was almost certainly obsolete by this time for daily use.

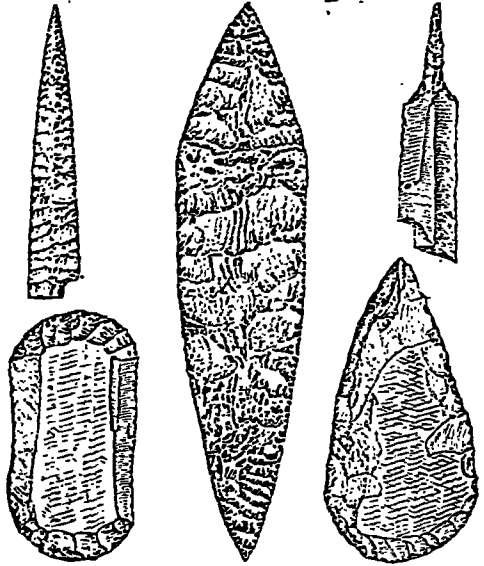
As for the difference in form between the coup-de-poing and the point, it is the outcome of what amounts to no less than a revolution in technique. The one is essentially a trimmed nodule, the other a trimmed flake previously disengaged by percussion from a nodule. We need not postulate a genius who suddenly introduced a novel method which no less instantly found favour with all, perhaps because it was labour-saving. During Lower Palaeolithic times the flakes detached in the course of making the coup-de-poing were utilised and even trimmed.

To specialise, however, on the flake implement and fashion it out of the choicest and most substantial segment of the nodule was reserved for the Mousterian culture in its later and most typical phases. True artistry is displayed in the most symmetrical and finished points, which illustrate, as it were, the survival of the fittest among numerous experiments, and occur in the proportion of about one to a hundred flakes in a representative Mousterian site, as Rutot has observed in Belgium and I can verify from Jersey. The well-trimmed base usual in this class of implements suggests that they were meant to be grasped in the hand.

The other tools of this period, awls, scrapers, planes and so on, tend to be rough, and are hardly more than adaptations almost forced on the designer by the accidental Purpose of the fracture of the material. Mousterian 'disk' A rather characteristic artifact, the so-called disk, which, unlike the rest, is often worked on the lower as well as on the upper surface, has been interpreted as a missile for throwing or perhaps slinging; but it is simpler to regard it as the direct successor of those round Acheulean coups-de-poing which presumably served to cut and scrape. Such a circular edge is awkward to hold, and seems to imply some sort of hafting.

Dwarf flakes, an inch to an inch-and-a-half in size, showing marks of use and sometimes secondary chipping, were very frequent in the Jersey caves; and I may add in illustration that on examining a little bag taken straight from the neck of a Tapiro pygmy of New Guinea (see page 197) and containing his greatest treasures, I found it to be full of just such sharp fragments and of nothing else. There is no need to assume that any of these smaller Mousterian flakes were arrow-heads, or that the bow had yet been invented, as there are a thousand other uses for a miniature cutting tool.

As for bone, its only known use at this time was as a sort of anvil or chipping block on which downward strokes could be made without blunting the edge of the flake. I have also found a large boulder the flattest top of which had been dented and almost hollowed out with hammering, probably in the course of breaking up marrow bones. The pounders and hammer-stones, by the way, when I compared a series of several hundred with a similar series from a Neolithic kitchen-midden, proved decidedly larger and heavier, show-



ARTISTRY OF SOLUTREAN CRAFTSMEN

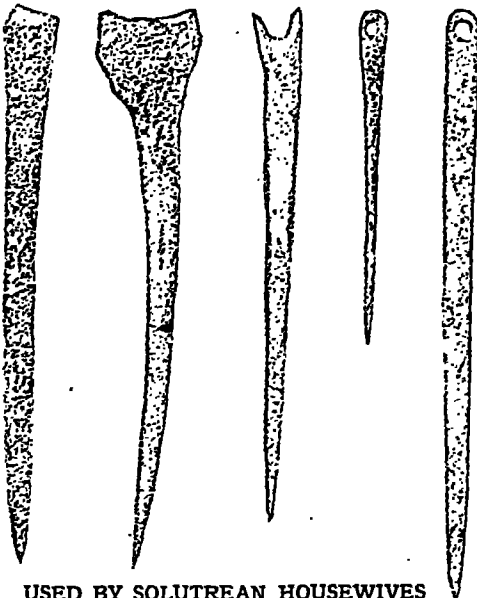
Solutrean implements, lethal and domestic, were beautifully fashioned. The delicate chipping of the whole surface of these javelin heads—that in the centre is of the 'laurel leaf' pattern—is a distinctive feature of Solutrean work.

After De Mortillet, Musée Préhistorique

ing that, as his bones confirm, Neanderthal man had far more power to his elbow.

Upper Palaeolithic times are the golden age of prehistoric art. This would be so if we regarded simply what one might call works of pure art, namely, painting and statuary, did one not suspect a magico-religious purpose to have prevailed in most cases; but even the articles useful for everyday life were lavishly decorated, as if these ancient cave men rivalled the Greeks of Periclean Athens in their passion for sheer beauty.

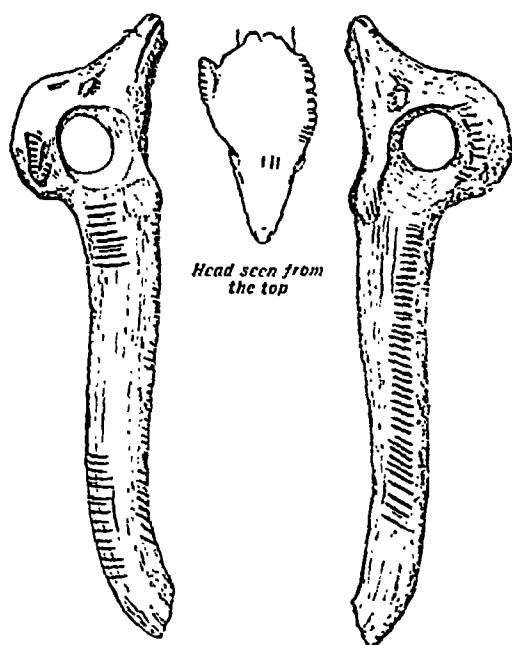
Which kind of man it was that took the lead in this development—whether it was big and handsome Cro-Magnon, or small and perhaps negroid Grimaldi, or yet another of the divergent racial types that now begin to appear—is not at present determined; but, one and all, these 'neanthropic' types can be contrasted with their 'palaeoanthropic' forerunners as in all essential features akin to modern races, and, in fact, no more ape-like than ourselves. Not that we need suppose the home comforts of these later cave men to have been strikingly superior to those of Neanderthal man. I could not perceive, in excavating an Aurignacian floor, that the



USED BY SOLUTREAN HOUSEWIVES

That the race which lived at Predmost, in Moravia, enjoyed many of the comforts of life is proved by their implements. Above, we see eyed needles carved from reindeer horn and fine bodkins of ivory and bone.

Photos, Prof. D. K. Absolon



NO TOOL BUT WAS LOVINGLY ADORNED

This piece of reindeer horn with its skillfully carved fox's head shows the artistic instincts of the Magdalenian hunters. Implements of this type used to be called chief's batons, but were probably used for straightening arrow shafts.

From Capitan and Breuil, 'Font de Gaume'

fare was more plentiful or varied; while the same untidiness and insensitiveness to smells were attested by the piled-up litter.

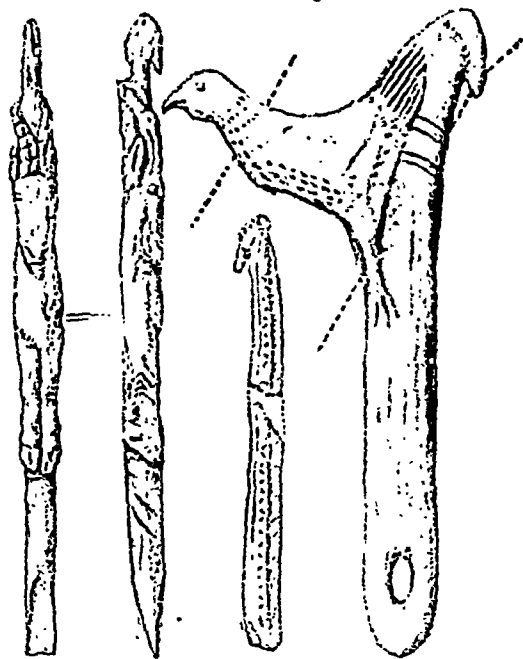
Yet that the culture was in every way more diversified and refined is the dominant impression yielded by their remains. Even the stone industry, which except with the Solutreans was perhaps something of a secondary interest, shows many a modified form: long, delicate blades, little scrapers of quaint design, limpet-shaped, parrot-beaked and so on; while the typical implement, the graver, the stand-by of the artist, is entirely new. In general the coarser method of percussion flaking would seem to have been largely superseded by pressure flaking, already known to the Mousterian worker.

As for the Solutrean masterpiece, the 'laurel leaf' point, trimmed on both flat faces by the finest pressure strokes—so that one can only suppose objects so exquisite and fragile to have had a ceremonial rather than a utilitarian function—it seems, with other characteristic implements such as a point with a single tang, to be the work of a people who thrust themselves in for but a while

between two stages in the development of the genuine cave artists of the Aurignacian-Magdalenian tradition. The latter worked on bone, ivory and horn in preference to stone, as giving greater scope to their plastic and graphic efforts.

Some useful implements made out of bone, such as needles, polishers, spear-points and harpoons—the last named exhibiting a very pretty development, the barbs growing gradually neater in shape and appearing first on one side of the shank and then on both sides—do not greatly lend themselves to decoration. Others, however, such as the so-called wand, the spear-thrower and the arrow-straightener (if such it be, and not a chief's baton, as it used to be the fashion to term it), are often richly engraved.

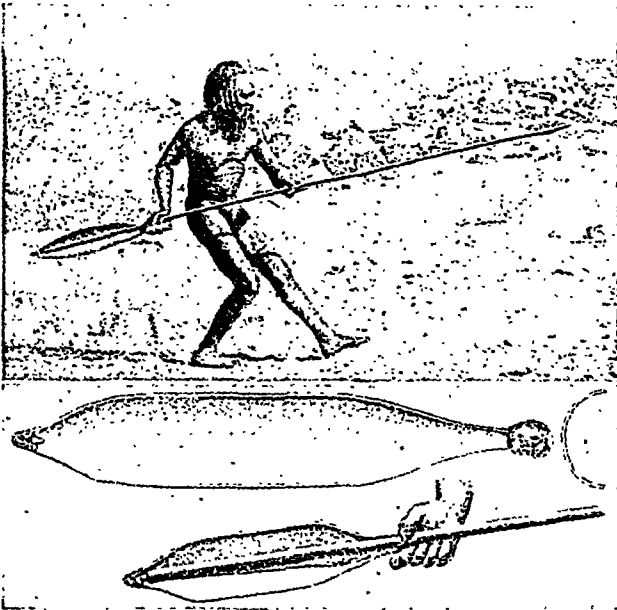
Nay, the certainty of touch with which a few strong lines are made to express living forms in their essential features is altogether astonishing—as if fine art could approach perfection without waiting on the rest of culture to develop correspondingly. And of course with this artistic skill there went dexterity in all branches,



FINE ART LAVISHED ON WEAPONS

Many specimens of Magdalenian spear-throwers preserved to us are richly carved. Above, we see a grouse (right, partly restored) and a chamois (left) carved on spear-throwers of reindeer horn. The notch to hold the spear-butt is best defined in the broken thrower (centre).

From Mas d'Azil, after Breuil and Pictet



MODERN SPEAR-THROWER : HOW IT IS USED

The spear-throwers of Australian aborigines do not differ essentially from those of Palaeolithic man. In each there is a notch to receive the spear-butt, shown in position above. The prehistoric hunter, therefore, probably propelled his spear in the same fashion as the tribesman seen here.

From Spencer & Gillen, 'Across Australia,' Macmillan & Co. Ltd.

of workmanship, as witness the minute eyes bored in some of the bone needles by means of flint awls, themselves appropriately delicate and hard to manufacture.

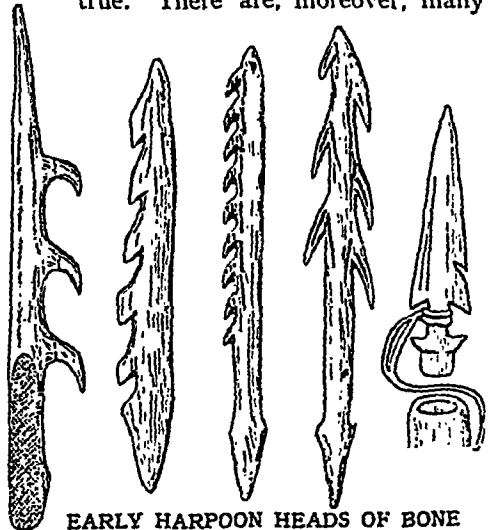
Again, while we are considering the utilitarian side of these cultures, let us note how inventiveness is by this time well in evidence. Thus, of the implements already mentioned, the spear-thrower, consisting in a long bone handle with a projection at the end into which the butt of the spear fits, so that the thrower gets an extra leverage by doubling, as it were, the length of his arm, is a most ingenious device. It is not surprising that the Australian natives, as Howitt records, attribute immanent magical power, a sort of 'devil,' to this instrument; and I myself have seen an Australian spear flung by this means a good 150 yards.

So, too, the harpoon heads have a swelling at the base, sometimes perforated, which shows them, if we can go by the analogy of the Eskimo weapon which is very similar in this respect, to have been detachable and connected with a line; this, held in the hunter's hand, would

enable him to 'play' his victim, perhaps a salmon and even more probably a seal—to judge from the fact that drawings of both these animals have come down to us from these days. The grooves, by the way, cut in some of these harpoon heads are probably not decorative but functional, and meant to hold some sort of poison.

Thanks to these same drawings we can proceed far beyond the evidence afforded by the surviving artifacts themselves in our reconstruction of a material culture which, of course, consisted largely of perishable things. Thus wooden clubs and spears of a great variety of form are depicted on the walls of the caves; where as often as not a game animal is portrayed with one or more of such weapons sticking in some vital spot—no doubt by way of a

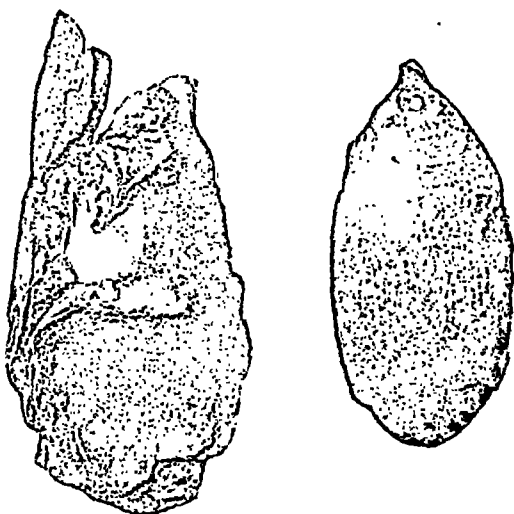
prefiguration believed to make the prayer, or perhaps one should say the spell, come true. There are, moreover, many



EARLY HARPOON HEADS OF BONE

Their finely barbed harpoon heads show the skill of Magdalenian craftsmen—an advance in technical knowledge being indicated by the type with barbs on two edges. They were probably affixed to shafts by a thong, like the modern Eskimo harpoon head seen here (extreme right).

After Breuil, L'Anthropologie



SOURCE OF A PREHISTORIC CHARM

Had the discovery been more important, this would have been one of the romances of anthropology. Part of a mammoth's tusk was found in the Paviland cave, Glamorganshire, followed a century later by the nodular growth (right) from which Aurignacian man made a charm.

mysterious pictographs which are variously interpreted as more or less symbolic representations of huts, nets, sledges and so on, and at any rate are suggestive of a many-sided mode of existence (see pages 199 and 205).

Meanwhile, in France and northern Spain, to which the typical Magdalenian culture is confined, it was apparently forbidden by custom, perhaps because it seemed magically dangerous, to adorn the cave walls with scenes of ordinary human life. But this taboo evidently did not apply to the contemporary inhabitants of eastern Spain—Capsians as they may be named in virtue of a presumed connexion with North Africa. The illustrations in pages 201–204 show that these people have left in their shelters a most vivid record of their daily avocations, and the hunting, dancing or fighting goes on before our eyes, very much as it does in the best examples of Bushman art in the South African shelters and caves.

We gather that the men were, at all events in their active moments, content to go mother-naked, if we exclude decorative trappings such as armlets, anklets and head-dresses made out of feathers. The women, on the other hand, wear seemly skirts reaching below the knee, and, though the breasts are exposed, there are

signs of ornamental adjuncts to the upper part of the person; while, for the rest, the elaborate coiffures and the attenuated waists prove the age-long appeal of Vanity Fair. Of course, when the adornments in question are of hard material, we have the originals and not merely their representations to go by. Ivory and bone, for instance, provide articles some of which were probably for purely personal decoration, such as bracelets, while for others a magico-religious significance can be assumed.

Thus, in excavating an Aurignacian site, the Paviland cave in South Wales, we came across a pendant carved from a mass of dentine that had formed at the place where a mammoth's tusk had snapped off short. Such a unique thing might well be held to be powerful 'medicine' for the fortunate hunter who found it. Teeth of various kinds, bored and with incised marks on them, were worn, as we may guess from the similar practices of the modern savage, to bring about sympathetic relations, on the homocopathic principle, with the animals of which they were once part. Skulls of the cave-bear have been carefully despoiled of their teeth in the sacred cave of Tuc d'Audoubert, and doubtless the great beast, haunter of such uncanny places, was sacred too; though it would be more of a guess to think of it as the totem of a clan.

As for the pierced shells, which from the beginning of the Aurignacian period form a prominent feature of the grave furniture, and were not only made up into necklaces and girdles, but must evidently have been also sewn upon the garments, these too may well have served as amulets rather than as trinkets; their presence in the graves suggesting, like the red ochre in which the bodies were laid, some mystic purpose such as the revitalising of the deceased. If it be true that some of these shells had found their way to palaeolithic Europe from the Indian Ocean, some very widespread belief in the virtue of shells may be surmised.

It would perhaps be worth recalling in such a connexion that in the island-strewn

Foreign shells
as Amulets

seas to the east of New Guinea there is a custom of making long voyages for the purpose of exchanging, not trade goods, as a modern economist might reasonably expect, but rather luck bringers, objects such as necklaces and armlets to which a mystic virtue is attributed; a virtue which is held to increase as the amulet acquires age.

Of all the supposed amulets of the European cave period, however, none is more plausibly identified with a sacred purpose than the objects usually described as bull-roarers. Strictly speaking, they are pendants which could never have served functionally as bull-roarers, so as to produce sounds as if of thunder or of a mighty rushing wind; nevertheless, they may well have been imitated from the real instrument of wood; and have been regarded as symbols with equivalent powers, such as those of controlling the weather, making things grow, stimulating human fertility and so on. (See page 299.)

Reverting to the genre paintings of the Capsians, we note a striking fact in the presence of the bow, one of the

decisive triumphs of early human invention. They are fine, large bows of more than one pattern; the arrows do not seem to be always, if ever, feathered, and the quiver is not in use. Dr. Macalister suggests that the Capsians coming up from North Africa may have been the first to introduce the bow into Europe. Certainly, the evidence for its use in Palaeolithic times to the north of the Pyrenees is not clear. The lighter darts depicted as adhering to the animals' sides in the Magdalenian rock-paintings may be hand-thrown assegais; while the Aurignacian bas-relief from Laussel, which incompletely represents a male figure with left arm extended—no bow-string, however, being shown, whereas there are lines indicating a girdle—is hardly convincing.

So far we have been concerned with the utilitarian, though, even so, often highly decorative, side of Upper Palaeolithic culture. Turning now to the remains of sculpture and painting, enough has been said to make it probable that a mystic rather than a purely aesthetic motive underlay most of these efforts, at any



WITH ITS FINDER: CLAY MODEL THAT HAS SURVIVED FOR 11,000 YEARS

Its discoverer, Norbert Casteret, had to swim for nearly a mile, sometimes under water, through a subterranean stream, to discover this Magdalenian clay model of a bear in the flooded cavern of Montespan. Its head, shown dotted, was an actual bear skull which has fallen off; and the body was riddled with spear thrusts, thus showing how prehistoric man must have used it in his ritual as a magic image to prefigure the success which he hoped to enjoy in the chase.



MASTERPIECE OF A PRIMEVAL LANDSEER

Perhaps because the ritual, as part of a fertility cult, did not demand their mutilation, the two amazing bison, male and female, in the Tuc d'Audoubert are a far more lifelike effort than the Montespan bear. Like it they have been preserved by the presence of water that has kept the clay moist.

From Bégouen, L'Anthropologie

rate apart from eastern Spain. A difficulty to be faced, however, is that magico-religious symbolism is usually unfavourable to realism or, as it may be termed, naturalism in art—as if the letter warred with the spirit, and too great an interest in the thing itself might interfere with the higher meaning which it was intended to convey by suggestion.

Now sometimes we have every right to infer a symbolic treatment, as in the case of the female statuettes with secondary sexual characters emphasised to the point of exaggeration, such as are illustrated in pages 198 to 200. Of course they may have stood for the type of beauty appreciated at the time, a sort of 'Hottentot Venus'; and there are those who detect definite steatopygy and other racial traits found among the South African Bushmen and their congeners. It is at least equally likely, however, that these figurines embody a fertility charm, and typify prolific motherhood in such a way as to bring out the idea at all costs and regardless of what actually occurs in the sensible world.

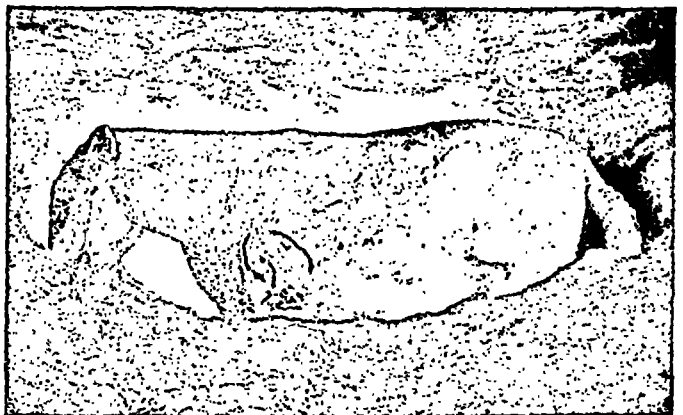
Again, in the cave of Montespan discovered in 1923

the clay figures of a bear and other animals are very rudely shaped; but, for one thing, the head of the bear is supplied by an actual skull, so that it is not improbable that the skin covered the rest; and, for another thing, the holes with which the figure is riddled prove that stabbing formed a part of the ritual of incantation, so that no lack of realism is due to the symbolism as such.

Contrast the other cave, Tuc d'Audoubert, where clay figures have likewise been preserved in a moist atmosphere caused by the proximity of a subterranean river. The two famous bison, male conjoined

with female, are modelled with the greatest fidelity to nature, and the accompanying rites probably involved not a mimic slaying, but an invocation to be fruitful and multiply; the abundant prints in the neighbourhood of naked feet with heels deeply impressed show how, after the fashion of the modern savage, these early folk danced out their litanies, and doubtless could do so with greater expressiveness than they could think or speak them out.

Here, however, we are not directly concerned with the motives of primitive art, except in so far as these are reflected



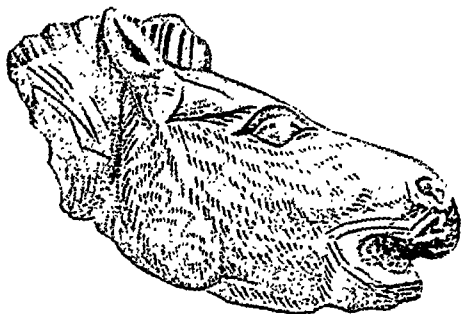
FROM THE HANDS OF THE WORLD'S FIRST SCULPTORS

Splendid rock reliefs survive to show that the hunter-artists could work with equal ease in materials less tractable than clay. At Cap Blanc a masterly frieze of bisons and horses, of which this is a portion, runs in procession round an open rock-shelter that is now a French national monument.

After Lalanne, L'Anthropologie

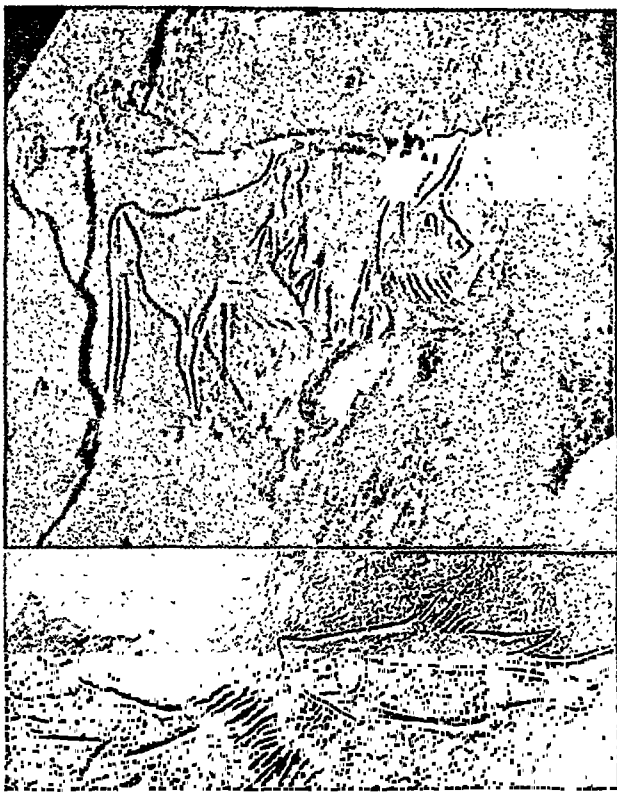
in, or govern, the technique. Whatever reason we assign—whether we suppose or not, for instance, that accuracy of portraiture was believed to exert a more compelling force in determining the fate of the victim—the fact remains that all the most finished work is strikingly naturalistic in tone, while the rest appears to embody less successful attempts in the same direction.

In the order of chronological development sculpture seems, as compared with painting, to have led the way, and, at any rate, with the Aurignacians to have achieved high excellence while the sister art remained tentative and reminiscent of a clever child's first efforts. It may well be that to represent in three dimensions, that is, in the solid, comes more easily to the mind than registering a mere surface impression in two dimensions, that is, in the flat; and one notices that a dog understands a substantive shape much better than a picture. Sculpture in relief might act as an educational bridge from the one to the other; though this is by no means certain. Early experimenting would naturally take place at first in soft and perishable material, and so leave few traces. By a



MASTERPIECE OF REALIST ART

To carve so virile and individual a horse's head from reindeer antler, the palaeolithic artist must have had real genius together with a very intelligently developed technique. The carving was found in the Magdalenian deposits at Mas d'Azil.



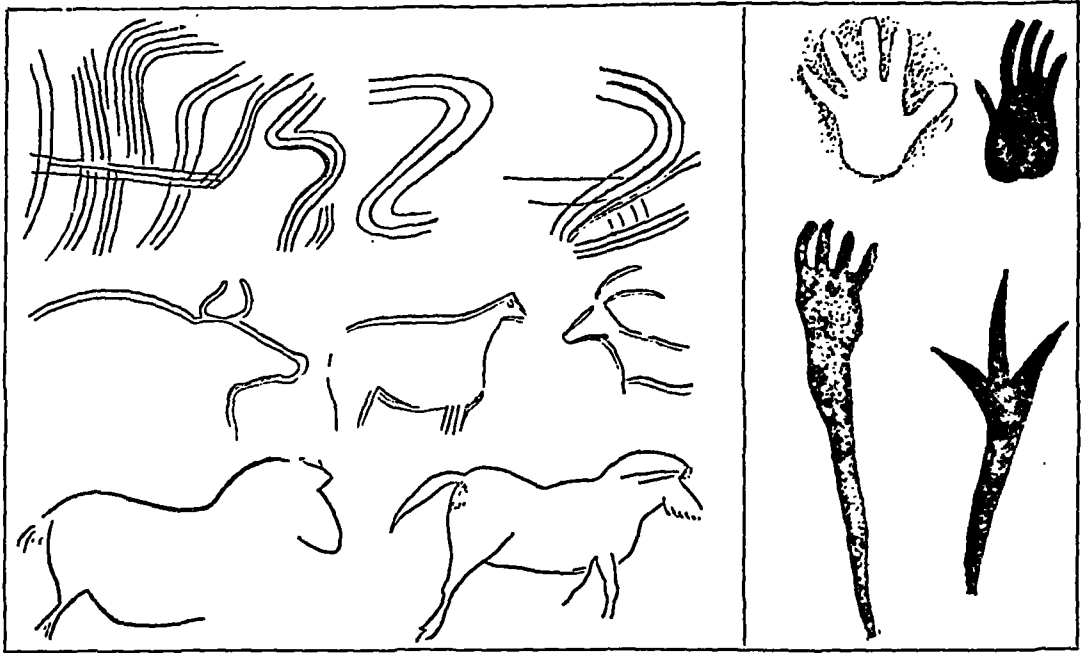
STUDIES FROM THE LIVING MODELS

Since these figures of a bison and a trout in the cave of Niaux are executed in sand, it seems reasonable to suppose that they were impressionistic sketches made by the artist while the originals were vivid in his mind—sketches that would refresh his memory when he came to draw on rock.

After Breuil, L'Anthropologie

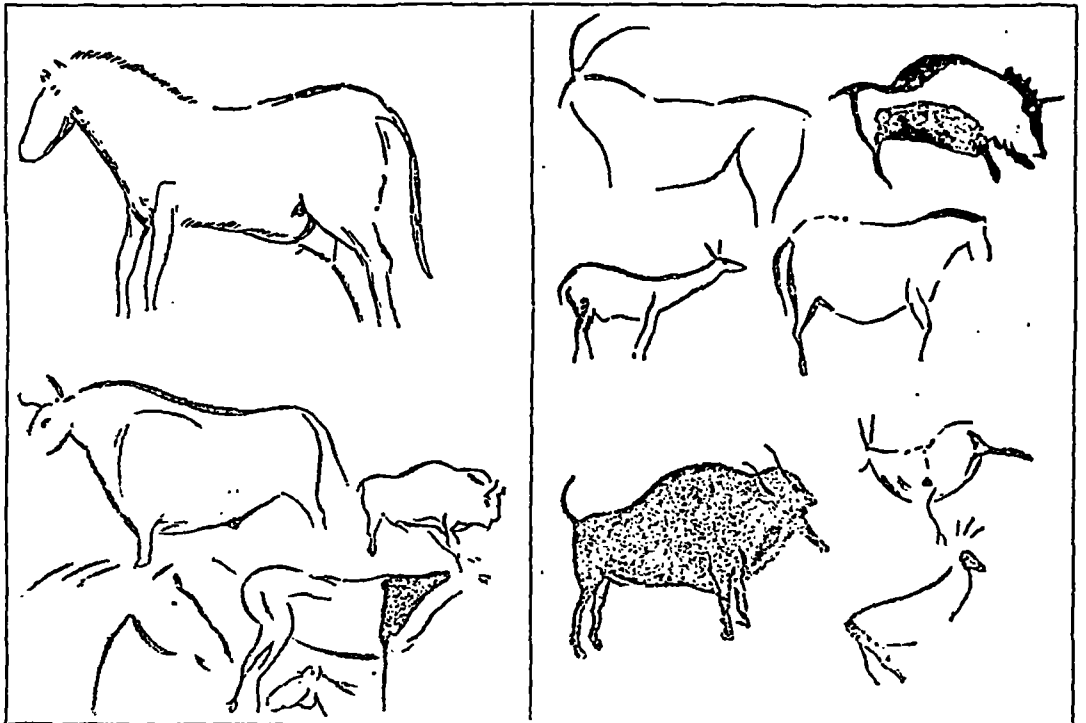
miracle the clay figures already mentioned have survived.

As for design in the flat, I have seen in the cave of Niaux a beautiful little bison drawn with a finger in the sand and preserved by a thin layer of stalagmite; while close by was a most convincing trout executed in the same way—the ancestor, I dare say, of a delectable fish from the neighbouring stream which I had consumed that morning for breakfast. Bone, however, and in even greater degree ivory, lend themselves to carving, as do also some of the softer kinds of stone such as steatite and limestone. Out of such materials are, for instance, fashioned the figurines already mentioned, which if mostly ill-proportioned in our eyes—the head of a girl from Brassempouy and the statuette of a woman recently



FIRST PHASE OF PREHISTORIC ART : RUDE AURIGNACIAN EFFECTS

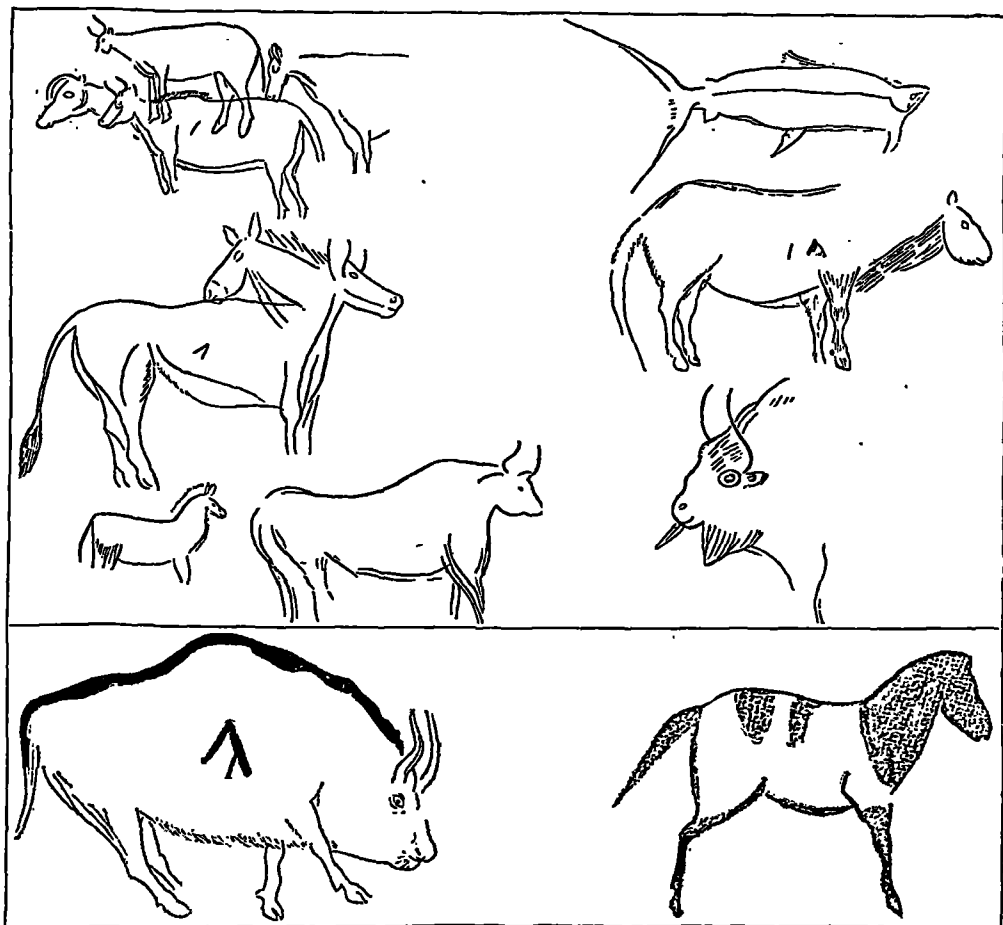
Sculpture seems to have been the earliest art developed by Man, for, of the four phases of prehistoric rock painting and engraving that can be made out, only one is Aurignacian, and that rude and primitive in the extreme. Engravings (left) consist of parallel scratches, perhaps to imitate the clawings of cave-bears, or of animal outlines with no perspective; while painting (right) is limited to impressions or stencillings of hands done in red ochre. Some of the hands have been mutilated.



SECOND PHASE : MAGDALENIAN ART IN THE FRESH VIGOUR OF YOUTH

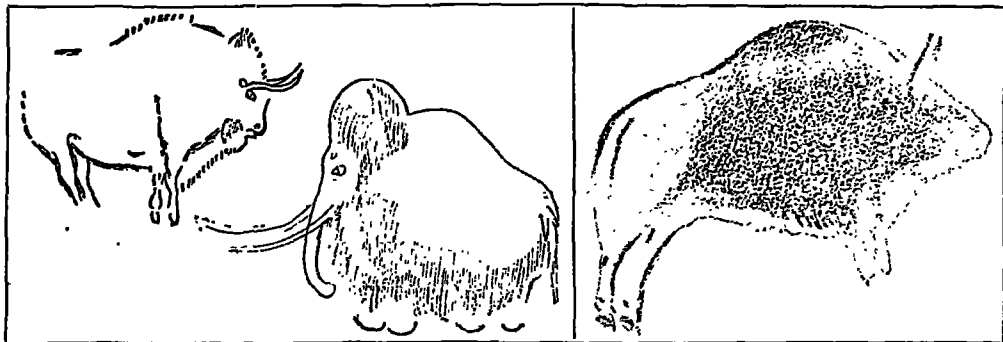
In the second phase, which with the remaining phases is Magdalenian, engraving made great strides; as the figure of a horse (top left) shows, perspective was appreciated and applied to the legs, while the outline was amplified with strokes for hair or shading. But the real innovation was the additional use of paint, which was laid thickly along a previously engraved outline and then spread out to give shading effects. Sometimes the whole figure (bottom right) was filled out in monochrome.

From Spanish cave paintings, after Cabré, El Arte Rupestre



THIRD PHASE : A PERIOD OF EXPERIMENT AND TRANSITION

Engraving in the third phase attains a high degree of excellence, as the top four examples testify ; the technique has improved and the subjects are more varied, though perhaps the treatment is less vigorous. The figures, however, are almost all small, as though colour were more and more occupying the artist's attention. Yet when we turn to the paintings (lower two) we find a series of rather unsatisfactory experiments involving the use of black and red splashes ; gone is the earlier simplicity.



FOURTH PHASE : IMPRESSIONISM HERALDS THE EXTINCTION OF ART

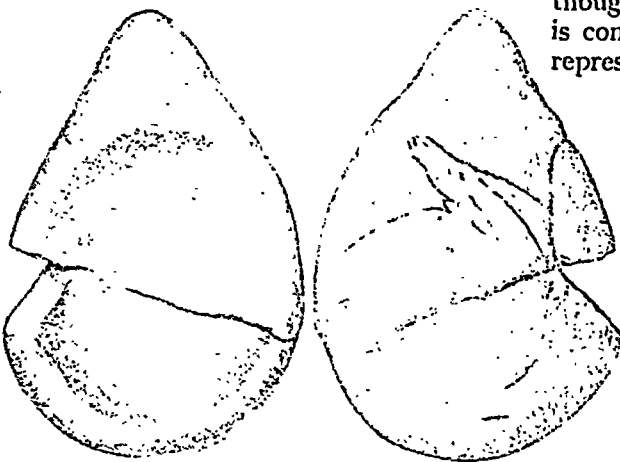
The painting of the third phase was experimental rather than genuinely decadent, for in the fourth it blazed out anew with a riot of polychrome effects, to appreciate which one must turn to pages 261-264. The figure on the right gives an idea of the method. Yet while engraving often helped out the paintings, engraving by itself declined. Pleasing results were certainly attained sometimes, but generally by the use of a bizarre sort of impressionism—see the mammoth in the centre.

*From Spanish cave paintings, after Cabré, *El Arte Rupestre* (except mammoth)*

found at Isturitz are not so ungraceful—do not lack a certain technical merit.

Animals, however, rather than human beings would seem to have inspired the cave artist to put forth his best, and some of these studies—that, for instance, of the head of a neighing horse from Mas d'Azil (page 253)—are among the world's masterpieces. The same contrast in the felicity of the rendering is noticeable in the two groups of wonderful reliefs cut in the living rock which Dr. Lalanne had the good fortune to discover. The human figures at Laussel, of which one has been shown in page 199, are strongly wrought and interest us because of their possible relation to fertility cults and the like; but they are not beautiful. At Cap Blanc close by, however (see page 252), a procession of sculptured horses and bison, eleven in all, runs round the wall of the shelter, and nothing could be finer than these reliefs, the product of rough stone tools, yet every one true to life.

To pass on from sculpture to painting, taken together with the allied art of engraving, four chief phases of development (see pages 254-5) are distinguishable for the northern region—that is, for France with the Cantabrian district of Spain—only one of which is Aurignacian, the remaining three being Magdalenian. In the first phase some of the early attempts can hardly rank as art at all.



SANDSTONE LAMP OF STONE AGE ARTISTS

Palaeolithic picture galleries are usually dark caverns, and this lamp of cut sandstone—characteristically decorated with an ibex's head—discovered at La Mouthe, explains the system of illumination. From the carbonised bowl it has been concluded that animal fat was burnt.

Thus in the way of engraving we find so-called 'arabesques' composed of a meandering series of roughly parallel lines. Those I saw on the walls and ceiling of the cave of Gargas seemed in some instances to have been simply traced with the fingers wherever the rock was faced with clay, while in others they had been scratched on the rock

Four phases of
Palaeolithic Art

itself, possibly with some sort of pronged instrument. Their significance, if any, is hard to guess; but I have elsewhere put forward the suggestion that they were intended, possibly with a totemic purpose, to imitate the actual claw-scratchings of the cave-bear, such as may be seen on the same cave walls to this day.

So also, if we turn to painting, it perhaps hardly amounts to art to stencil the hand by placing it on a greased surface and blowing charcoal or red ochre from the mouth, so as to get the print in outline, as was done repeatedly in the same cave of Gargas—doubtless with some mystic purpose in view, as is further suggested by the fact that often the fingers are mutilated, as if by way of sacrifice.

True art, however, makes its first diffident appearance in the form of outline drawings of animals, either incised with a graver or in monochrome paint. Usually the body is in profile and only one front leg and one back leg are shown at first, though four legs appear before this phase is concluded. Both horns, however, are represented as if in a full-face view, since the artist has not yet learnt to distinguish between what he sees and what he merely thinks.

In the second or Lower Magdalenian phase there is altogether more life in the engraved figures; the perspective of the horns and the shaping of legs and hoofs receive due attention, while within the outline there are slight attempts at shading. Moreover, engraving now begins to be associated with painting, the monochrome line of paint being often laid fairly thickly on top of a previously engraved outline and then cleverly broadened out so as to give the effect of shading



CAVE ARTISTS WORKING BY THE FLICKERING LIGHT OF STONE LAMPS

Some idea of the disabilities under which palaeolithic artists had to labour is afforded by this reconstruction of a scene in one of their galleries. The lamps would always have to be held in position by assistants, and the light must have been exceedingly dim and smoky. It will be noticed that the artist who is standing upright uses a rude palette upon which to mix his paints.

Reconstruction by Charles R. Knight, courtesy of American Museum of Natural History

—much in the style of a charcoal stump drawing, as Burkitt points out in his excellent account of the subject. Perhaps this is the most vigorous moment in the whole development.

In the third or Middle Magdalenian phase, engraving has become confined to rather small figures, which in certain examples, however, such as those from Teyjat, display excellent quality. Painting has in the meantime suffered a set-back, having been seduced into experiments in flat wash and in a sort of chess-board arrangement of red and black, which were disappointing. The result is that in the fourth or Upper Magdalenian phase, whereas engraving is now confused and decadent, painting recovers something of the splendour of the second phase, but by elaborating its methods and mixing its paints; these polychromes being likewise in some cases helped out with the graver.

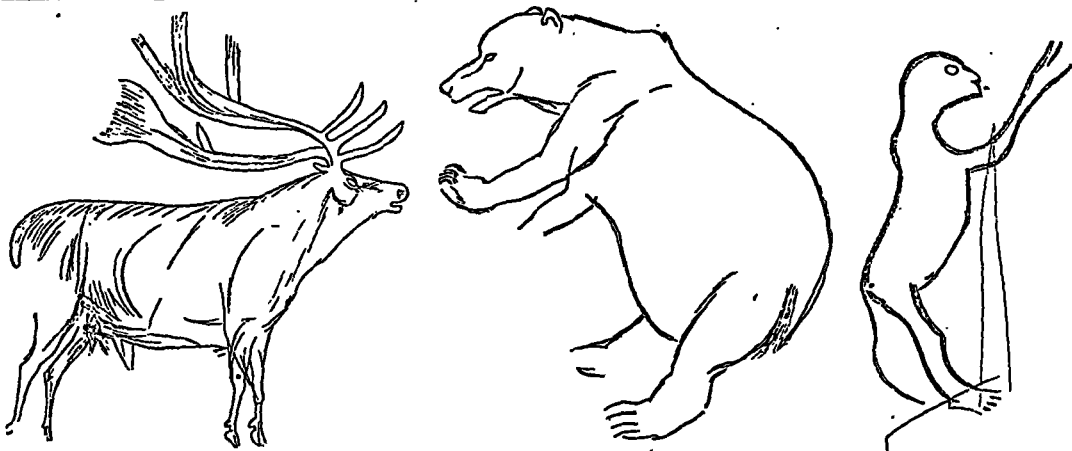
Sometimes, too, there is a tendency towards impressionism, the lower parts of a mammoth at Font de Gaume appearing as a mass of shaggy hair, with a gap below across which the eye travels to four barely indicated feet (see page 255). Altogether, this latest art smacks of the school rather than of nature, and may have helped to bring about its own final disappearance by becoming too self-conscious and pre-occupied with style; though doubtless

there were about this time other causes, for instance climatic changes, at work to overwhelm the Magdalenian culture in general ruin.

Meanwhile this division into phases applies only to the three northern centres of artistic ascendancy, the Dordogne, the French Pyrenees and Calabria, the last-named showing local peculiarities of a minor kind. Throughout this region the affinity of the forms of fine art is so close that I have sometimes wondered whether the same artists may not have been in request in the different parts, and whether more intensive study might not enable us in some cases to recognize an individual master's hand in more than one locality.

As for eastern Spain, where there is little engraving and the painting has both an outward style and an inner spirit of its own, a certain development here also can be traced, thanks to the custom of those days which tolerated the superimposition of one picture on another; as indeed did also the Bushmen, though it is said that the latter would not allow a man's work to be thus defaced for a space of three generations after his death.

A word may be added about the artist's outfit. His paints, consisting of red and yellow ochre, black oxide of manganese and so on, were pounded on schist tablets which served as palettes, and were stored



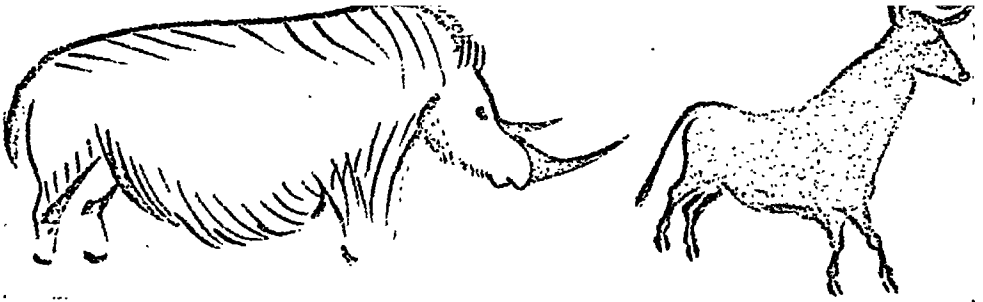
A modern free-hand sketch could scarcely excel these engravings in sureness of outline—even the figure on the right in the first Aurignacian phase of art, of which we cannot say whether it is a monkey or a magician in disguise, has an undeniable crude vigour. It is in the cave of Hornos de la Peña; of the others, the stag is from the famous cave at Altamira and the bear from Teyjat (Périgord).



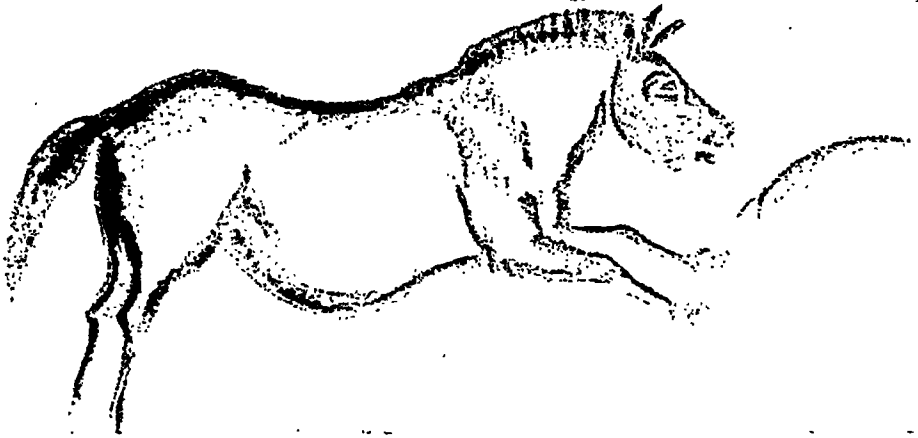
The rock drawings in pages 254-5 were chosen not for their individual excellence but for their conformity to type. The palaeolithic draughtsman, however, could take artistic flights that carried him far above the average, and here we have a picture-gallery of his masterpieces. This page is devoted to engravings, and to show what these actually look like to-day a photograph is given of a cave wall at La Loja, Cantabria, with an outline key above it (left). Right is an ox from Les Combarelles.

ENGRAVINGS THAT SHOW THE PALAEOLITHIC ARTIST AT HIS BEST

After Breuil, Capitan and Cartailhac



Two methods of using paint are here illustrated. For the woolly rhinoceros (see page 190) red ochre has been applied in outline, with a result like a crayon drawing; whereas the bull is executed in a flat black wash afterwards varied by scraping to produce an effect of light and shade. Nothing could be better than the brilliant impressionistic treatment of the rhino's hair.



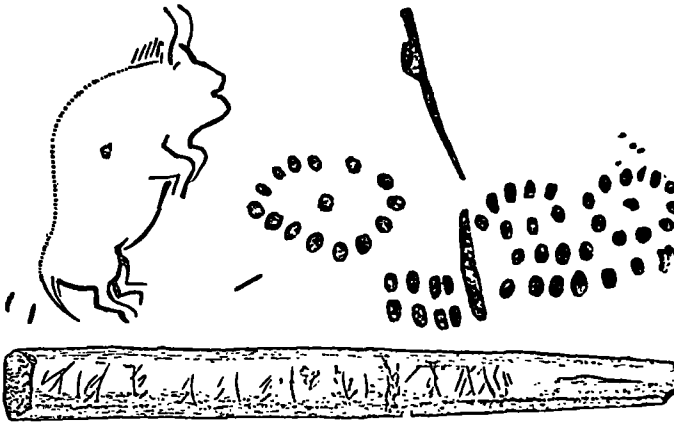
We do not know when the horse was first domesticated. It was introduced from the East into Egypt, for purposes of war, only in the seventeenth century B.C., and was almost certainly never bridled in palaeolithic Europe. This wonderful wild horse in the Font-de-Gaume cave, then, was hunted as prey like any other game, and not used in the service of Man. It is done in black.



If the greatest purity of line was achieved by the palaeolithic artist in his engravings, yet it was his use of paint that produced the most startlingly modern effects. In pages 261-4 are some of his polychrome masterpieces; this page shows monochromes—except for the photographic reproduction, whose varied colours may be seen at the bottom of page 263. It is in the Altamira cave in Cantabria; on its right is a reindeer in black from the cave of Font-de-Gaume in the Dordogne.

MARVELLOUS PAINTINGS PRODUCED IN THE DEPTHS OF GLOOMY CAVERNS

After Breuil, Capitan and Cartailhac, 'Peintures des Cavernes Paléolithiques'



MAN'S EARLIEST METHODS OF WRITING

It is possible that Palaeolithic man had evolved a sort of writing. At Niaux a figure of a dead bison is accompanied by symbols which apparently refer to it; while on a rod of reindeer horn from La Croze de Gentillo are engraved signs which may be crude symbols, or perhaps a hunter's tally.

After Cartailhac and Breuil, L'Anthropologie

in hollow bones, or sometimes might be made up into a sort of pencil, looking just as if it had come from a modern stationer's shop; a bone stylus was also used to lay on the colour. All these things have been found; as well as the stone lamp, very like an Eskimo's, by the dim light of which an uneven face of rock, hidden away in the black interior of a mountain, was adorned with shapes as glorious as they are time-defying.

It remains to speak of those engraved or painted signs which may be supposed to embody an early attempt at writing. There can be no doubt, I think, that veritable pictographs were in use. At Niaux, for instance, in one special part of the long gallery a considerable distance away from any of the pictures of animals, one sees a large group of such marks—dots and strokes and other more complex signs distributed over the rock surface.

Amongst them one seems to make out the forms of clubs and other vague adumbrations of actual objects; but it is clear that the general intention is to symbolise rather than to represent directly. In another part of the cave such signs occur close to the picture of a wounded bison—one, by the way, which has for its back simply a projecting gable of rock of just the right shape—and here one is tempted to read off the inscription as the spell expressive of the weapons and the

encircling tactics whereby the death of the quarry is to be encompassed; there are marks like clubs and circular patterns of dots which may stand for the hunters or for their tracks.

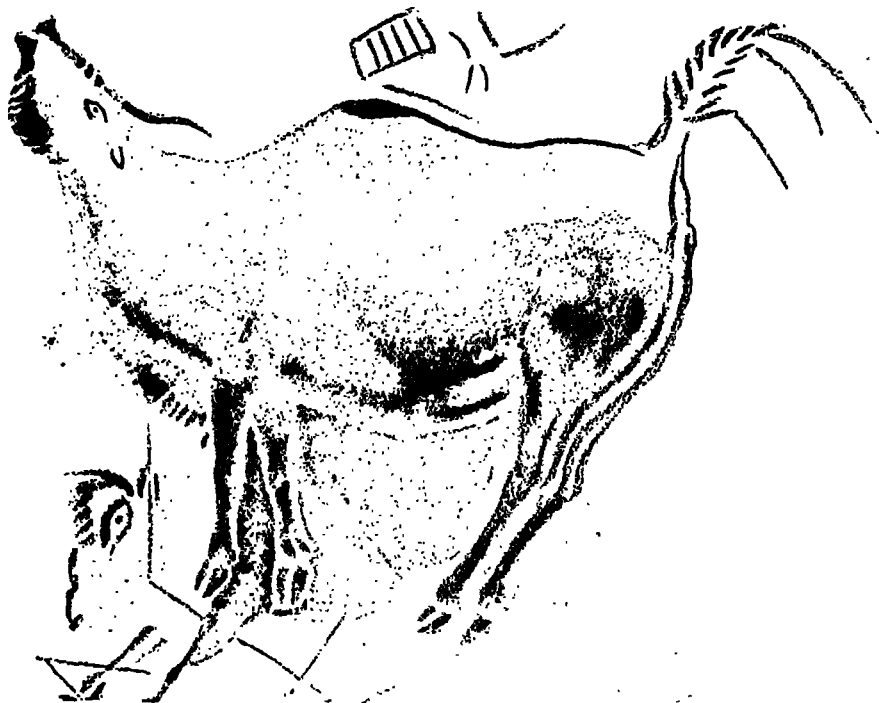
Then there are engraved marks on objects of ivory and bone, the most striking example being the ivory rod from La Croze de Gentillo, which has been compared with an Australian message-stick; these may well have been mnemonic signs to help the bearer to remember the terms of his report, or to enable a hunter to keep tally of his victims, or perhaps in other cases to convey a spell or to indicate private property. As

it is, one can but throw out bare guesses as to the more intellectual and ideal side of what spiritually, if not economically, amounted to a rudimentary civilization.

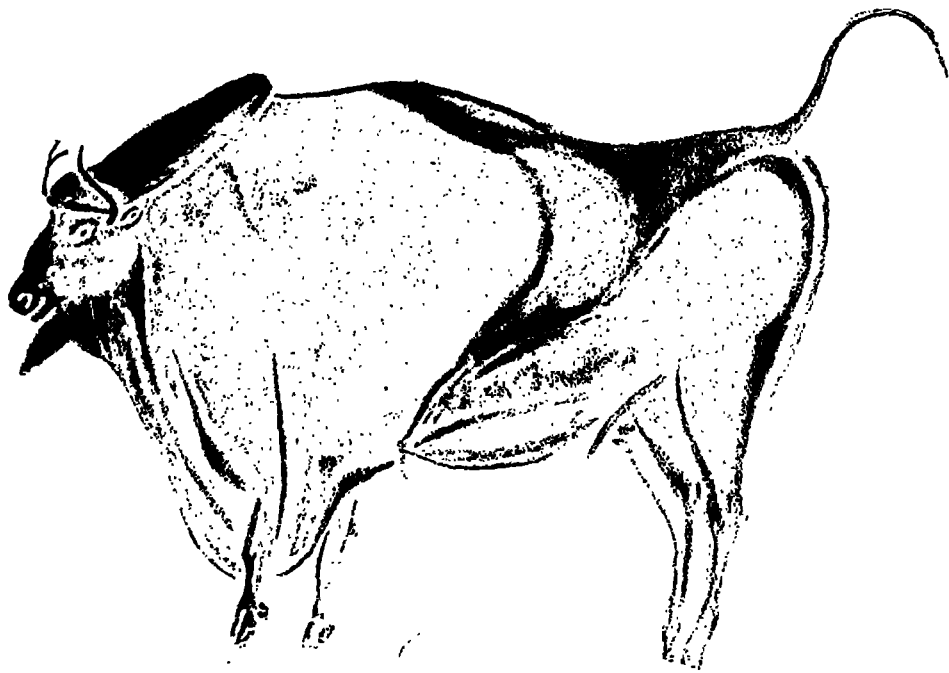
Let it be realized too that, if the caves have preserved much, still more has perished irretrievably—the wood-work, the leather-work, the feather ornaments or, again, the masks, such as the reindeer mask of the sorcerer whose portrait, reproduced in page 206, is to be seen in the cave of Les Trois Frères. I remember how in Honolulu, when, admiring the treasures of the late dynasty, the gorgeous feather garments and the like, of which the local museum is full, I reflected that there was hardly a thing on view—the very stone-work being in a friable lava—that with normal wear and tear would leave a trace of itself in a thousand years—not to speak of the ten to fifteen thousand years that separate our time from the heyday of Upper Palaeolithic culture.

The succeeding age, conveniently termed the Epipalaeolithic, is from the standpoint of arts and crafts one long chapter of backwardness and squalor. The dry cold of the Magdalenian period had given way to damp and dreary conditions—a sort of protracted thaw. The cold-loving fauna had retreated north, followed possibly by

How much has
perished?



But for the strange fact of its being painted over an earlier picture, the magnificent lowing bison in the Altamira cave could easily be taken for the product of some modern nature-school of art. There was no prejudice against so defacing a previous work among the Magdalenians; possibly after a while its 'magic' was thought to have lost efficacy. Note the tectiform signs (see page 205)



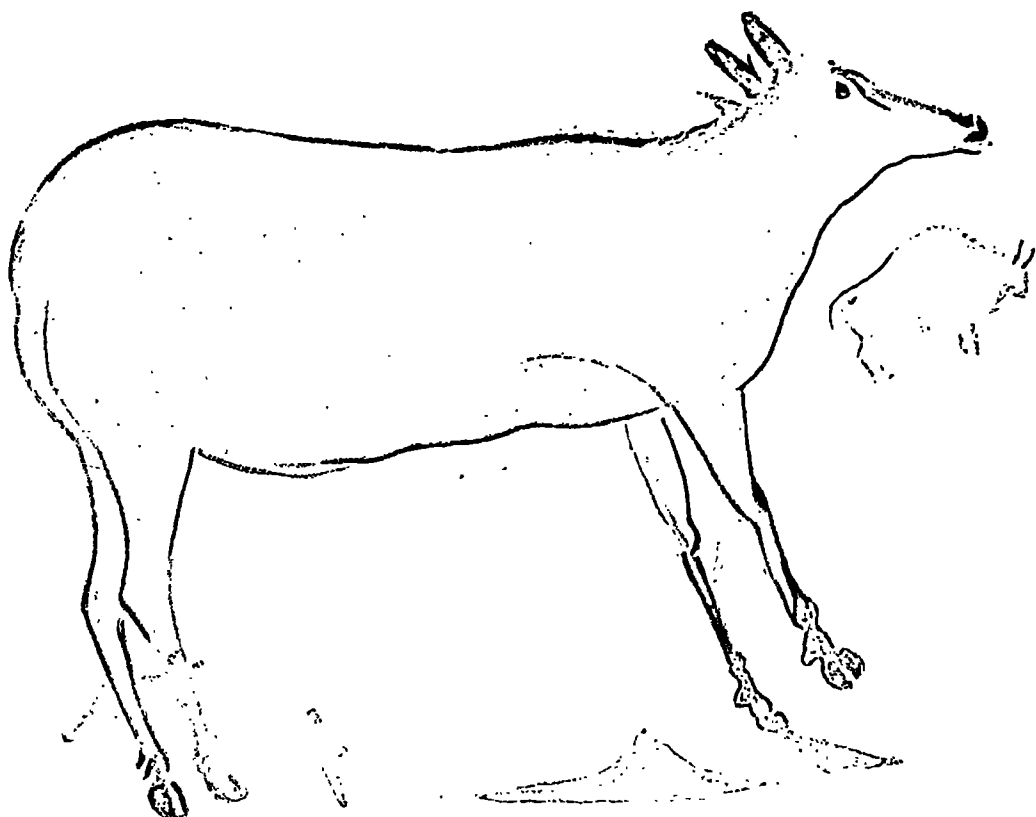
The best preserved bison in the Altamira cave is a splendid upstanding male, instinct with the fire of life. In nearly all these polychrome paintings the effect was helped out by the use of a graving tool, while advantage was often taken of the contours of the rock surface. The whole of the back of the engraved bison illustrated in the text-page opposite is a natural bulge of rock

BISON AS IMMORTALISED ON ROCK BY MAGDALENIAN HUNTERS

Illustrations in pages 261-263 from Breuil, Capitan and Cartailhac, La Caverne d'Altamira

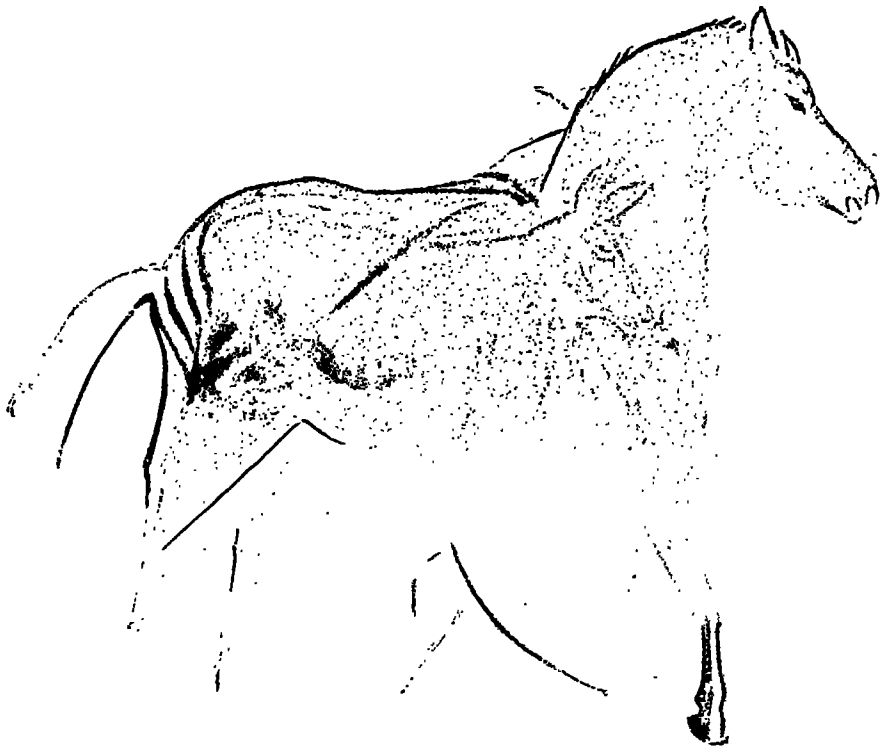


Almost every example of palaeolithic art surprises one with what seems to be its amazing modernity. The art products of the early civilizations on the Nile and the Euphrates attained a technical perfection unknown to Magdalenian man ; but his paintings, three times as ancient, can catch the impression of speed—take this running boar for instance—as no Egyptian ever could.

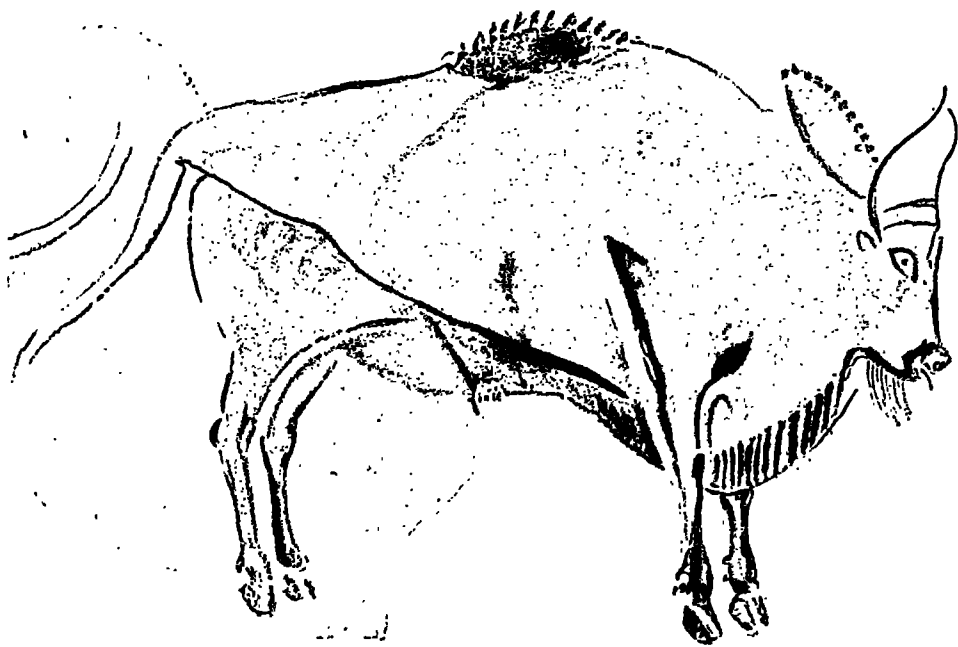


More of the strange red signs, that are so variously interpreted, appear with this lively rendering of a hind ; in this instance they may possibly represent throwing-clubs. The small black bison (right) seems to belong to an earlier phase of art. Notice the skilful effect of perspective as applied to the legs and ears of the hind ; together with the boar above, it comes from Altamira.

BOAR AND HIND : TWO BEASTS THAT SUPPLIED THE ARTIST'S LARDER

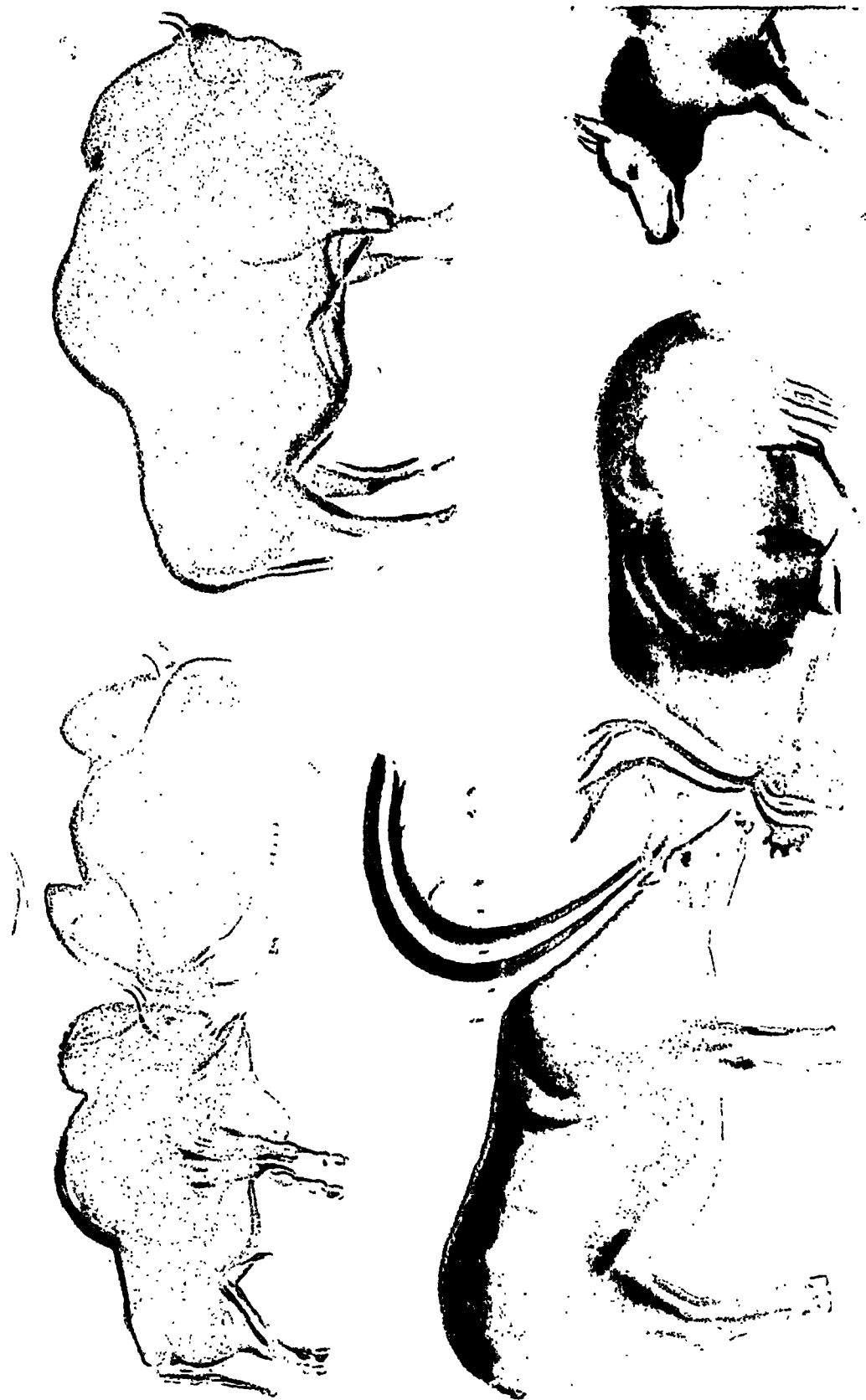


Although the reverse appears to be the case, this unfinished horse in black and red was drawn on top of the monochrome hind, which shows through so clearly because its head is partly engraved. The eyes, ears, nostrils and part of the head of the horse, too, are brought out by scraping the surface of the rock. Observe that the rendering of the hoof is particularly faithful to nature.



These are the colours of the female bison whose photograph, showing her as she actually appears on the rock, has been given in page 259. In the execution painting, engraving and scraping have all been employed, together with wiping or washing to lighten the colour where necessary. It is instructive to compare the easy grace here manifest with the stiff solidity of Assyrian winged bulls.

PAINTINGS FROM THE DAYS WHEN THE HORSE WAS HUNTED FOR FOOD



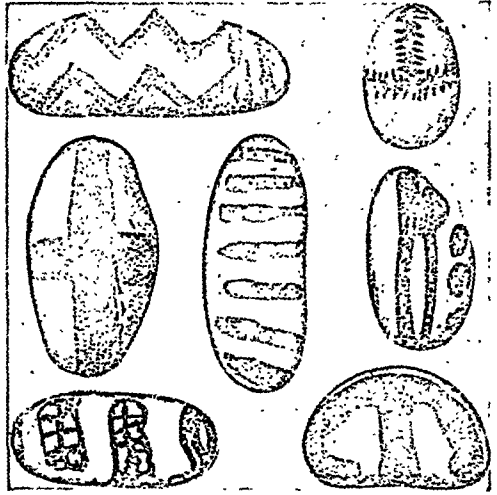
COLOURS EMPLOYED BY THE ARTIST-HUNTERS OF PREHISTORIC EUROPE TO PORTRAY THEIR VARIED QUARRY

All the rock paintings in the three preceding colour pages are examples chosen from Altamira, in the Cantabrian district of north-western Spain. Here is a group from the Font-de-Gaume cave near Les Eyzies in the Dordogne (southern France). The bison above leave no doubt that the two regions, in spite of local variations, enjoyed a homogeneous culture—note that the right bison of the facing group has been painted over an elephant. Below, the brilliant study of a wolf has an impressionistic flavour, and the two reindeer, of which one is kneeling down to graze, are superb.

From Capitan and Breuil—La Caverne de Font-de-Gaume

the most vigorous of the hunting tribes. If any of these remained behind, they, in company with the immigrant peoples that gradually arrived, had to accommodate themselves to new material, as witness the harpoon heads of the Azilians; these, formed out of red-deer antler, seem decidedly clumsier than those which the Magdalenians used to carve from the now unprocurable reindeer horn.

Fine art had perished. Probably its development was bound up with peaceful and settled conditions, such as are certainly suggested by the closely packed Magdalenian shelters of the Dordogne, where the valley of the Vézère harboured the palaeolithic equivalent of a regular garden-city. On the other hand the Capsians, who herald immigration from the south, are convicted by their rock-drawings of a fondness for war, the defeated foe bristling with the arrows that have been shot into him. Promoted by these methods, invasion by the Azilian-Tardenoisian folk, who apparently follow



PAINTED PEBBLES AS CHARMS

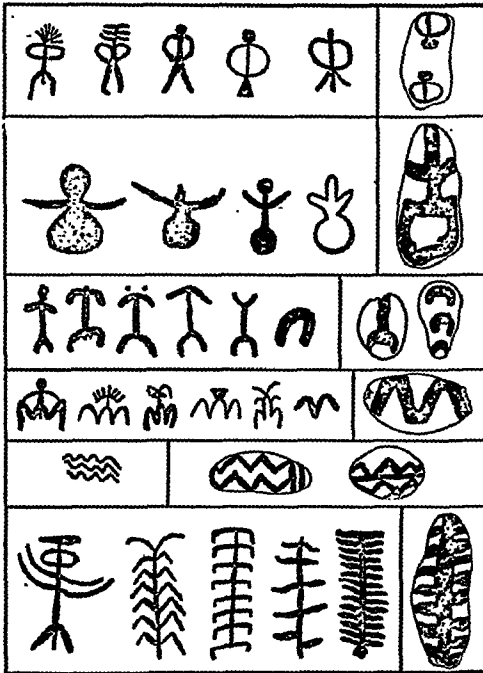
Little is known of the superstitions of Palaeolithic man, but it is probable that these light-coloured pebbles with their red paint marks, said to be stylised human figures, had some magic significance. They were found at Mas d'Azil.

After Obermaier, El Hombre Fósil

in the footsteps of the Capsians, may have soon extirpated all taste for the gentler pursuits of life.

At most there survived, as is to be seen best in Spain, a highly stylised mode of representing men and animals, which as fine art is contemptible, but may have served some religious or pictographic purpose. The famous Azilian pebbles with their queer markings have given rise to all manner of ingenious interpretations, but to-day the prevailing view is that these signs, some of them not unlike the letters of our alphabet, are one and all highly stylised versions of the human figure. The fact that in a cave near Basel similar pebbles had been carefully broken into fragments suggests that they may have been 'soul-boxes,' or life-tokens, such as modern savages sometimes store in a safe place so as to impart a corresponding safety to the individuals whom they represent.

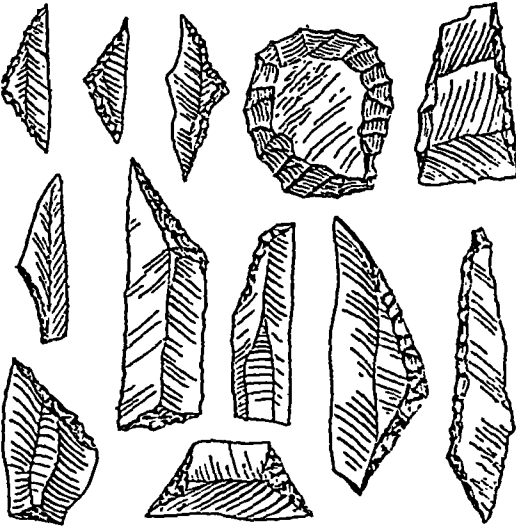
As for stone-work, the output of this period is poor, and one must suppose that there had been a reversion to the use of wood. The little geometrically shaped flints, angular, curved or crescentic, known as the Tardenoisian industry and having a distribution extending from western Europe to Egypt and even India, may



MAN GROTESQUELY SYMBOLISED

The designs on the painted pebbles from Mas d'Azil closely resemble other palaeolithic figures which definitely symbolise men and women. Above, some pebble designs (right) are compared with Spanish versions of human beings.

After Obermaier, El Hombre Fósil



DEGENERACY IN FLINT-WORKING

The craftsmanship that produced Tardenoisian flints in late Palaeolithic times compares very unfavourably with, for example, that of the Solutrean artificers. Typical Tardenoisian implements are small and geometric in form.

After de Mortillet, Musée Préhistorique

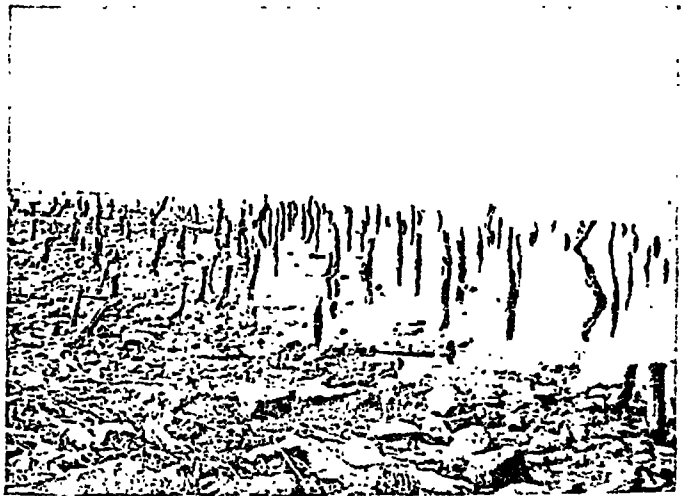
have had more uses than one, and only gratuitous dogmatism would lay it down for certain that they were stuck like teeth into wooden clubs, or that they served instead of fish-hooks, or that they provided a means of extracting edible snails from the shells. For the rest, though the study of this period is important as a key to the earlier movements of the present population of Europe, with its mixture of long-heads and broad-heads—the latter now appearing not only in central Europe but even in Portugal—the cultural remains of such midden-folk would scarcely repay a more extended notice.

In the older nomenclature the Palaeolithic is immediately succeeded by the Neolithic Period, though it was always agreed that the latter began with a phase of transition which some went so far as to regard as a downright hiatus—a gap in the evidence corresponding to a state of decline and depopulation. Now that the Epipalaeolithic cultures, so-called because new data,

especially from Spain, prove their strict continuity with the Palaeolithic, have been found to cover a lengthy tract of time, it becomes a nice question how far a true Neolithic culture period is worth recognizing in itself, apart from the first-fruits of the ensuing Age of Metal.

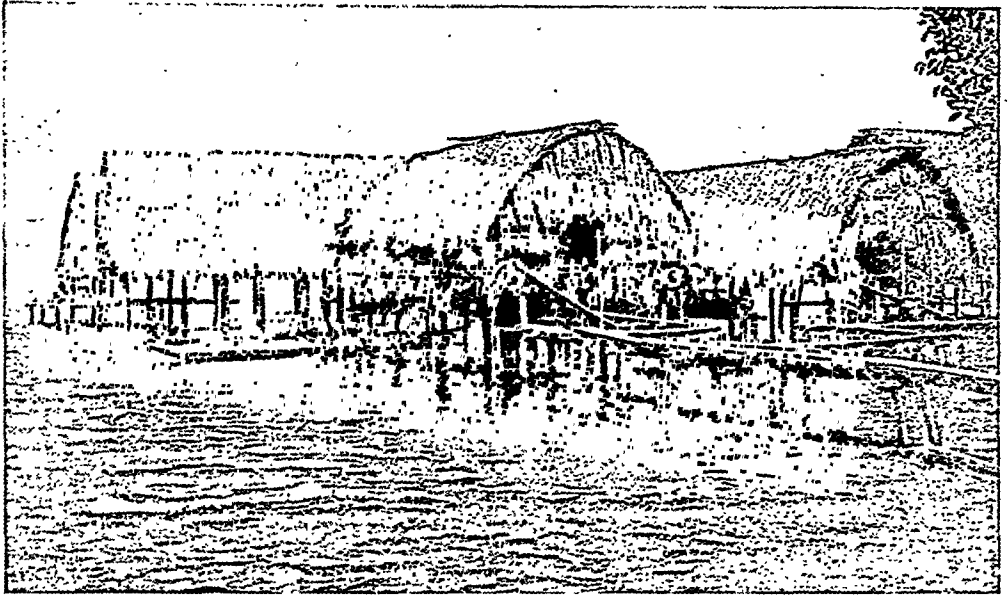
Undoubtedly there is a considerable overlap between the two as regards Europe as a whole, sundry parts of the west and north, notably Scandinavia, using stone only, though fairly advanced in other respects, at the very time when copper and even bronze were being worked in the east and south. The fact is that the distinction between the real Stone Age of food-gatherers and the Modern Age of food-producers is not expressible in terms of the material that supplied their cutting instruments.

An economic revolution due to the domestication of animals and plants brought about a contrast in the life of Europe as great in its way as that exhibited between the habits of red man and white man in North America. The contrast was all the sharper because the new culture which was to make such short work of the old had originated outside Europe, and was at once too alien and too advanced to assimilate any essential features of the previous dispensation.



SITE OF ANCIENT LAKE-DWELLERS' VILLAGE

The construction of easily defensible villages over water marked a great advance in civilization. The dwellings were raised on piles—here we see the broken stumps of piles that once supported a village on the shores of Lake Morat, in Switzerland—and remains show the engineering skill of the builders.



MODERN PILE VILLAGE ON THE COAST OF THE ADMIRALTY ISLANDS

To-day, huts built upon piles are not uncommon in Australasia, and do not appear to differ essentially from the neolithic lake-dwellings of Europe. They are built over the sea and are connected with the shore only by an easily removable causeway in order to secure the inhabitants against hostile attacks; it is suggested that the neolithic lake-dwellings were also devised for this purpose.

Courtesy of Field Museum, Chicago

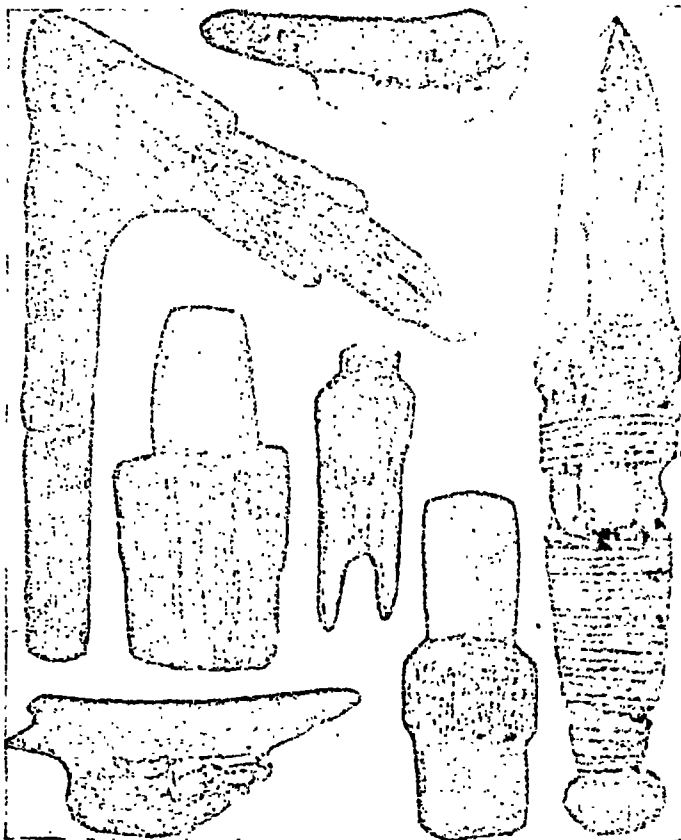
Thus to explain the Robenhausian culture so-called, namely that of the Swiss lake-dwellers, with their characteristic kine, swine, cereals and so on, recourse must be had to the analogy of far-off Anau in Turkistan, where the Pumpelly Expedition found much the same things in use at a date estimated to be considerably earlier than the organization of the great river-civilizations of Mesopotamia and Egypt.

Such an hypothesis of a foreign derivation need not debar us from holding that Switzerland itself, if it did not initiate, at least fruitfully developed the new principle that Man henceforth was the master, not the slave of nature. When assisting at the excavation of a site on the shore of the Lake of Neuchâtel, where two settlements, both equally devoid of any trace of bronze, lay one over the other, I was much struck with the vast superiority of the later one.

Not only were the piles of the earlier lake village short and feeble, while those of the later one testified to excellent carpentry, but from the stratification observable in the copious deposits—all the more plentiful, no doubt, because each

structure in turn had been destroyed by fire—it was clear that, whereas the first group had lived strictly on local products, the very stone for their implements being poor stuff from near at hand, the second set of inhabitants had established trade relations extending hundreds of miles in at least three directions. For they had amber from the Baltic, shell necklaces from the Mediterranean and fine homogeneous yellow flint from Grand Pressigny in France.

Indeed, when we consider this lake culture as a whole, even when abstraction is made of Bronze Age developments which lie outside the scope of the present chapter, we cannot but marvel at its richness; a tour round the splendid museums of Switzerland being needed in order to bring the impression home. Of course, peat is a wonderful preservative, enabling us to take stock of the industry in wood; so that we have, for instance, the hafts, wooden or else of deer-horn, in addition to the stone axe, as well as examples of their fabrics, woven materials, string-nets and basketry, and even of the grain or nuts which they ate—the last-named more or less carbonised, yet none the less possible



PRODUCTS OF SKILLED IMPLEMENT MAKERS

The advanced stage of material culture reached by the lake-dwellers is exemplified by their ingeniously hafted stone axes and flint daggers. The axe-heads, as may be remarked above, are ground and polished to shape, and have good balance and a clean-cutting edge; they were fitted to hafts of wood or horn.

From Grant McCurdy, Human Origins

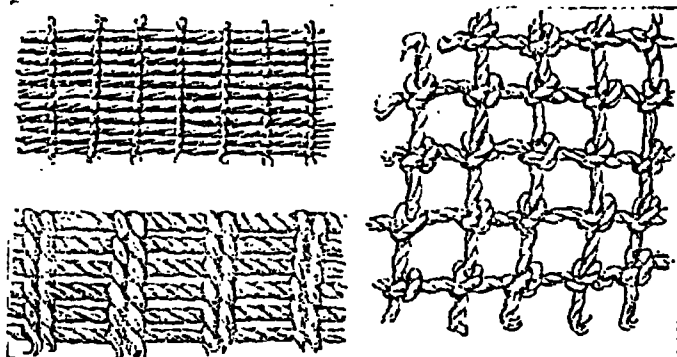
to identify. Allowance being made for the inevitable absence of similar relics of Magdalenian times, it still remains obvious how far man has advanced in material comfort.

Even so, security of a purely economic order may be purchased dearly if as the result of increasing wealth, with corresponding density of population, there is more bitter conflict between men to offset a mitigated struggle with nature. The lake-dweller may have been partly led to adopt his amphibious way of life by the fear of wild beasts such as wolves; but the analogy of modern Malays or Papuans, with their pile-dwellings of very similar con-

struction, suggests that the primary object was self-protection from human enemies. In the Swiss examples the dwellings were quite near the shore, but doubtless a removable causeway connected it with the platform on which were the huts of wattle and daub.

As for the frequent destruction by fire, of which there is ample evidence, this may be the work of enemies; but one must also give due weight to the fact that the primitive wooden hut, with a flat stone for its hearth, was particularly liable to such disaster. This, for instance, was also the constant fate of the old-time 'long house' of the American Indian. Indeed, in general the domestic architecture of the period was flimsy and impermanent, consisting of mere cabins, often of beehive shape and partially sunk in the ground for better shelter. Here, no doubt, as in a Lapp dwelling to-day, the folk herded together, glad to be protected from the weather, and not greatly minding stuffiness and the fleas.

Incidentally the archaeologist regrets the almost complete disuse of caves where a stratified deposit could collect, since in



BEGINNINGS OF CLOTH-MAKING IN EUROPE

In the New Stone Age cloth was used for garments, and, judging by surviving samples, the lake-villagers were already expert in the art of weaving. Above, we see two types of coarse cloth and a net, all made of flax, found near Swiss lake-villages at Robenhausen, preserved in a bed of peat.



MAIN CHAMBER OF A MASSIVE TOMB

All the monuments of the 'megalithic' communities in western Europe were probably erected to honour the dead; such an intention is obvious in the instance of the elaborate dolmen at La Hougue Bie, in Jersey, whose central chamber is here shown. This tomb is built throughout of great monoliths.

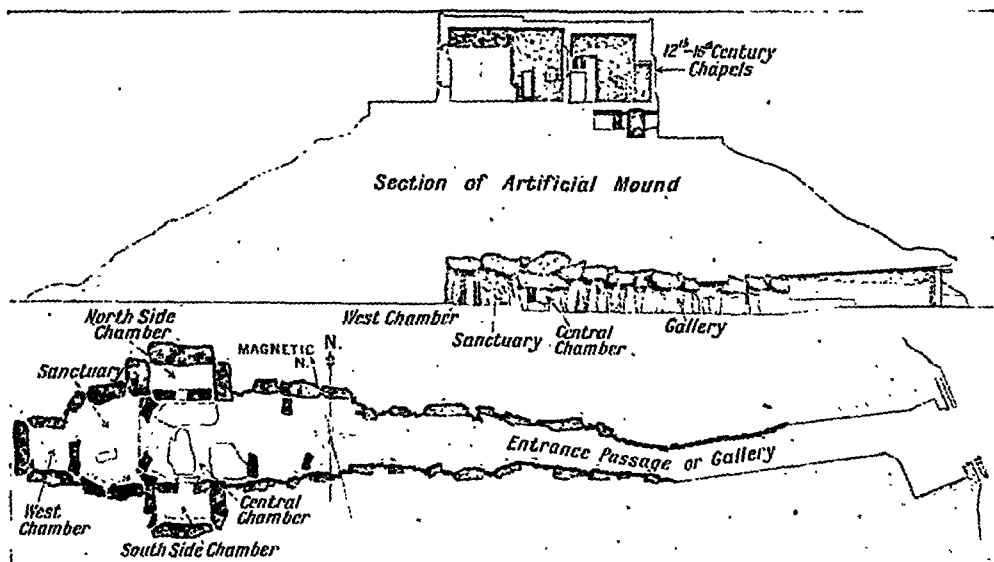
Photo, Société Jersaise

this day. This at least holds for the so-called Megalithic Zone, which runs more or less coastwise from the Black Sea and Mediterranean round by the Atlantic and North Sea as far as the Baltic, leaving the central parts of Europe unaffected. The different types of structure comprised in the European branch of this complex—for there is another branch to the east which, if it exhibits much the same forms in Asia, diverges considerably in what are taken to be allied developments in the Pacific—are almost too well known to need detailed description.

his eyes the dweller in huts, tents and other makeshift habitations stands for mere surface-finds having no bearing on the time-order.

On the other hand, in startling contrast to the meanness of the abodes of the living, the dead are housed magnificently in erections of unhewn stone that last to

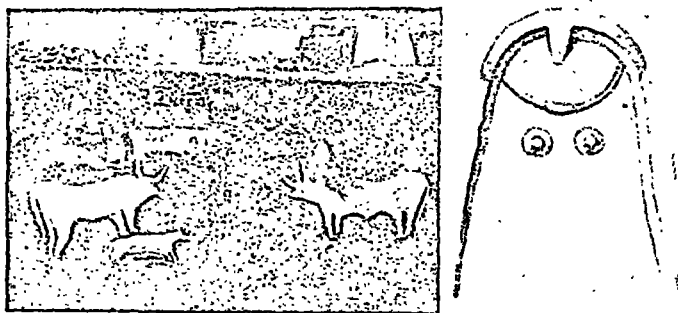
Most typical of all is the dolmen, a single table-stone set upon uprights. The term is sometimes used to include all constructions involving a series of such cover-stones and uprights, which are otherwise known as passage-graves. The latter vary in ground-plan, the simplest being of uniform width throughout, while in other cases the passage leads



TOMB OF A NEOLITHIC CHIEFTAIN CROWNED WITH A CHRISTIAN FANE

At first sight the symmetrical, cruciform tomb of La Hougue Bie appears to be an artificial cave cut into a hillside and lined. Actually, however, the conical mound—consisting of almost 20,000 tons of earth—in which it is situated was built round and on top of the dolmen. These sectional diagrams give the plan of the dolmen, its side chambers and long entrance-passage, and show how the twelfth century chapel stands exactly over the tomb-chamber.

Courtesy of Société Jersaise



CONTRASTING ASPECTS OF NEOLITHIC ART

The general decadence of art in the Neolithic Period is illustrated by the conventionalised female figure (right) carved in a cave in the Petit-Morin (France). But the representations (left) of bulls and a sow that adorn a neolithic temple in Malta almost equal the masterpieces of the palaeolithic artists.

Malta relief by courtesy of Dr. T. Zammit

into a wider chamber having, it may be, secondary cells attached.

A fine example of this more elaborate type has recently been discovered in Jersey under a tumulus known as La Hougue Bie, composed of some 20,000 tons of earth. The monument itself is about 75 feet long, of which about half is passage and half chamber; the latter, with three annexes, is arched over by six capstones, each with a span of about 16 feet, and weighing up to 30 tons.

The incredible labour and architectural skill displayed in such an edifice raise questions, which science is by no means yet prepared to answer, concerning the organization and resources of the megalith builders; the more so because in the case of the Channel Islands, which are full of fine megaliths, neither a numerous population nor opportunities of amassing wealth can well be assumed—any more than in Malta where there are, nevertheless, structures, approximating to the megalithic type and wrought without the help of metal, which neither the Iberian Peninsula nor Brittany nor Ireland nor Scandinavia can outshine, rich as each is in such monuments. These Maltese temples will be found illustrated in greater detail under Chap. 19; while Chap. 20 contains further material about the more northerly megaliths.

This is not the place in which to discuss whether that preoccupation with the fate of the dead, which was so prominent a feature of Ancient Egypt, had spread, rather sooner, it would seem, than the use

of copper and bronze, to the West and North by way of sea-borne trade, or, again, how far such a culture drift was affected by secondary developments originating in various local centres—Iberia, the Paris basin, Scandinavia, South Russia. Here we have only to take note of the existence of an architecture inspired by religious motives—the worship or at least care of the dead, in the first instance, with probable evolution of the house of the dead into a temple of the gods.

But in such a connexion we may take note of the rather feeble manifestations of sculpture and painting in this period.

Thus, though Malta's temples can produce sculptured forms worthy of a palaeolithic artist, the Paris basin is content with rude idols representing a female with prominent breasts, presumably a fertility goddess of the type of the Great Mother of Anatolia. Painting and engraving are confined to the production of hopelessly stylised animals and human beings which can hardly, one would think, have been intended to please the eye, though it is impossible to guess what magico-religious or pictographic meaning they had, if any.

As compared with lake-dwellings and megaliths, taken with all their cultural associations, the remaining topics that relate to the period are no doubt of minor importance. A word, however, is needed about the dawn

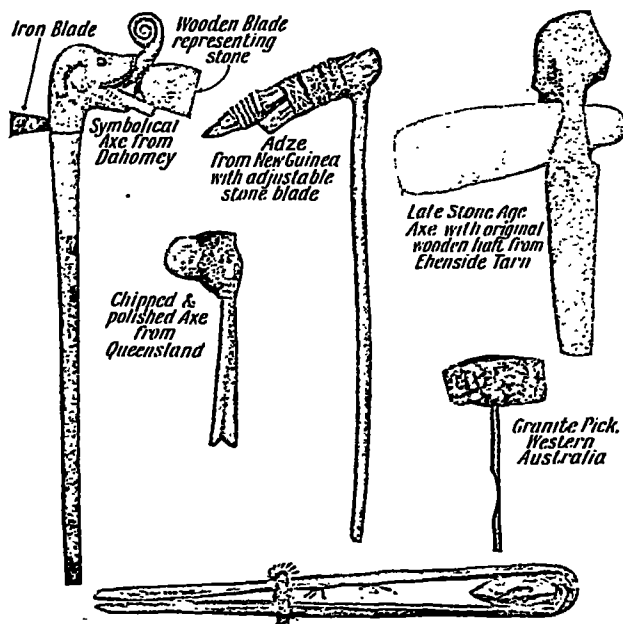
**Dawn of the
Potter's Craft**

of the art which from this point onwards affords the archaeologist his best evidence for differentiating and dating the various cultures: namely, the art of ceramics.

That pottery of a rude kind is occasionally found in palaeolithic sites has been asserted, and I have myself found on a Mousterian hearth portions of fire-hardened clay which a credulous person might easily take to be rudimentary potsherds. It is safer, however, to regard the potter's art as introduced into western Europe along with the rest of the food-producing tradition. Certain it is that in the Eastern Mediterranean, when copper

was barely known or not at all, fine ware could be made, whereas the much later advent of bronze in the West found the pottery still coarse and wanting in variety of form. True, in connexion with the dolmens one comes upon considerable advance in ceramic refinement where it is not yet certain that metal is in use; but in such cases it is better to give the Bronze Age the benefit of the doubt, and to suppose that one has crossed the conventional line which divides prehistory from proto-history, the Stone Age from the Bronze and Early Iron Ages.

It remains to consider the stone-work which, after all, gives the Neolithic Period its distinguishing name; though this corresponds to superficial distinctions. To think of it as the period of polished stone is misleading for at least two good reasons: one, that much of the stone was not polished; the other, that the process, once begun, went on well into the Age of Metal. Polishing, or at any rate grinding, which is not quite the same thing, goes back at least to Epipalaeolithic times, when



Australian Stone Axe mounted in bent withy
STONE IMPLEMENTS, ANCIENT AND MODERN

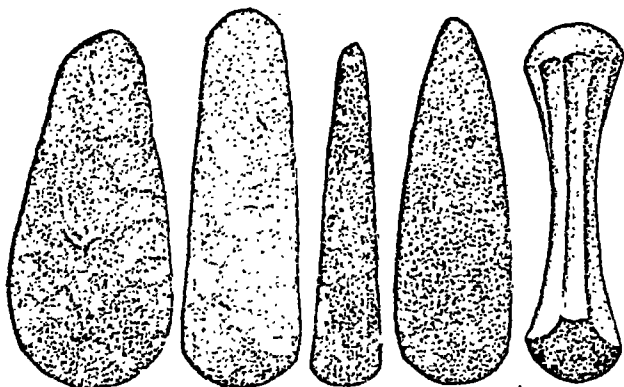
The axe discovered in Ehenside Tarn, in Cumberland (extreme right) illustrates one method, employed in neolithic times, of fitting a stone axe-head to a wooden haft; a modern parallel is seen in the Australian aborigines' stone-headed axe (bottom). Other methods—which were probably also known to neolithic man—of hafting stone heads are used in the remaining three.

From the British Museum

it was occasionally applied to flint, after chipping, to get a better edge.

How Palaeolithic man failed to discover it I cannot think, since Mousterian slices of greenstone show rubbed edges which

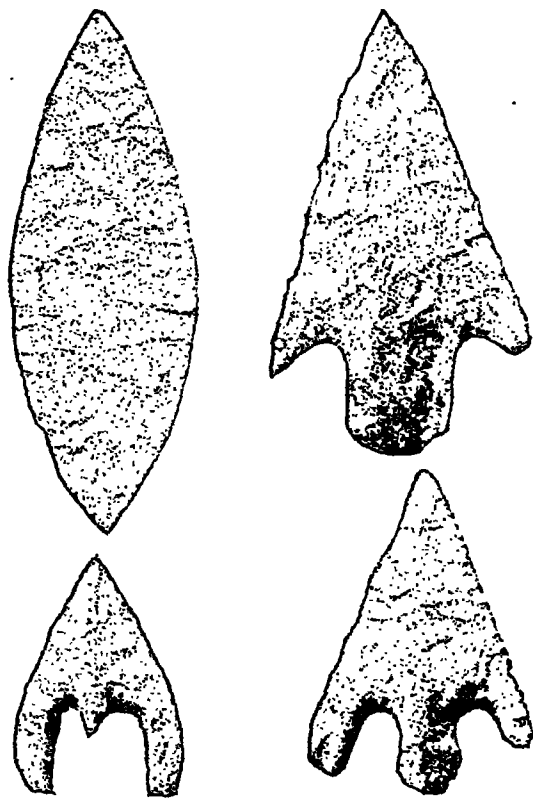
were almost certainly produced by human agency, though no doubt accidentally in the course of some culinary operation such as braising roots. Probably a conservative predilection for flint prevented the earlier stone-workers from taking advantage of a method less suitable for flint than other kinds of stone—diabase, jadeite and so on, which it was left to neolithic man to appreciate. Most of these are rather richly coloured stones which appeal to the eye, and certainly the best neolithic celts are meant for show at least as much as for use. Contrast the rough



IMPLEMENTS MADE TO PLEASE THE EYE

During the Neolithic Period stone implements became more symmetrical and precise. The new fashion of polishing instead of chipping stone contributed largely to this result, although elegant implements were still made by chipping, like the three on the left. Right is a polishing tool next to a polished celt.

From the British Museum



ARROW-HEADS BECOME MORE DEADLY

Neolithic cultural advance is shown by the evolution of long-barbed arrow-heads (below) from the clumsier type (top right) whose barbs are merely the shoulders formed when a tang is cut in the simple, lozenge-shaped form of arrow-head (top left).

From the British Museum

Australian celts which almost invariably have no more than the edge ground and, however serviceable, are ugly.

In Europe, however, not only was the necessary sharpness produced by grinding, but in the best examples the whole surface is polished to a uniform brightness, due attention being likewise paid to complete symmetry of shape. Probably a ceremonial use once attached to many of the choice specimens now figuring in our collections; and indeed in modern Melanesia celts are set up on graves so that the ghost may rise up and enter into them if he will.

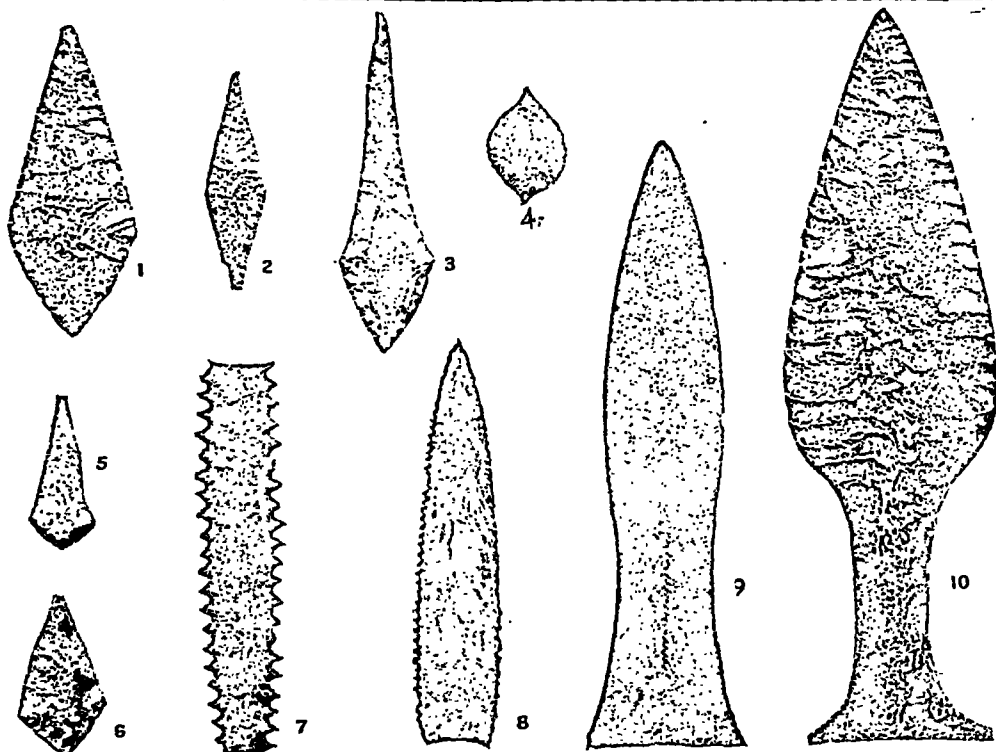
As for the mode of manufacture, any gritty rock surface might be used as a grindstone, and the grooves so made are often still to be recognized. Polishing, however, especially if the material of the celt be hard, involves far more labour than grinding an edge, though perhaps no

greater skill. Of hafting such a celt several neolithic fashions are known and more may be suspected. A very simple plan, for instance, is to bend over a flexible stick and make it fast underneath by binding, the Australian native using gum for this purpose, in which case notching or grooving the stone may be employed to give the handle a better grip. But the typical way, more especially with a blade of almond shape, is to thrust the tapering end through a hole in a thickish wooden haft reinforced with sinew or other binding material so as to prevent splitting.

Another method, involving perforation of the head either by picking with a flint awl or by twirling a stick loaded with wet sand, might suit a ceremonial better than a practical use, since the stone is apt to crack at the place of boring. Neolithic drilling, by the way, can usually be detected by its 'hour-glass' appearance, the work being started at both ends and stopping short of a cylindrical effect. Or, finally, the blade may simply have its butt driven into the handle, whether this be at right angles to form an axe or adze, or endwise as in a chisel.

Next in importance to the celt in a series illustrating neolithic stonework is the arrow-head; though, since the bow dates back to the Upper Palaeolithic, while on the other hand metal, long after it was in use, was too valuable to prefix to a vagrant missile, it is far easier to determine the type than the sequence-date of a given find. It is a fair guess, however, that when flint was first adapted to this purpose, a sharp point was of chief concern and a convenient base for attachment a secondary matter.

From a lozenge-shaped flake a tang which could be stuck into a hole in the shaft would evolve, by having the flanking edges cut, until first horizontal shoulders and then recurving barbs would be formed. Such a general theory of development, however, must ignore local variations; as when Ireland, which for reasons of its own was keenly interested in arrow-heads, exhibits certain crescentic shapes which are almost without a parallel, at any rate in western Europe.



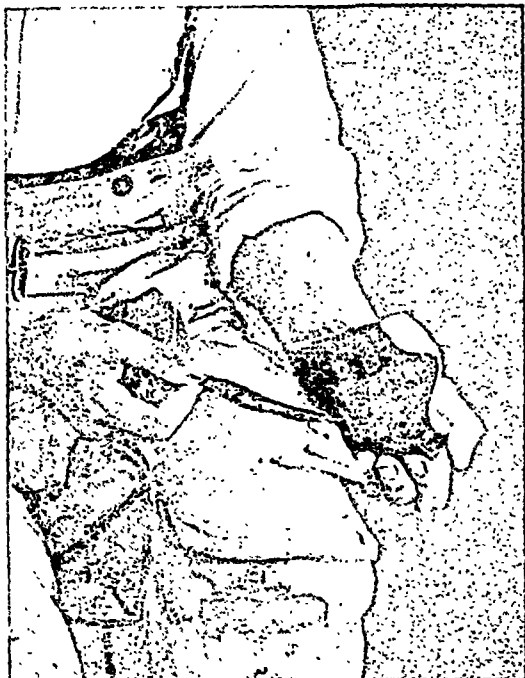
Refinement and beauty of form distinguish neolithic flint implements, such as are represented above, reduced to about one-third scale. The most ingeniously worked are perhaps the daggers (9 and 10) from Denmark; but the Irish lance and arrow-heads (1-6) are also well finished. The points with serrated edges (7 and 8) were found in Denmark; similar specimens occur in Egypt, but nowhere else.



The fact that the flint articles shown in this page were manufactured in Denmark, Ireland and Egypt gives some indication of the wide range of neolithic culture. The Egyptian flint-workers were, however, unrivalled; they even perforated thin disks of flint, by chipping, to make bracelets—a difficult operation that often failed. Above, we see the stages in the manufacture of such a bracelet, compiled from disks and fragments rejected through the development of fault or fracture.

NEOLITHIC MAN'S INGENUITY AND SKILL DISPLAYED IN FLINT-WORK

From the British Museum



SURVIVAL OF THE WORLD'S OLDEST INDUSTRY IN MODERN ENGLAND

At Brandon, in Suffolk, flint mining and working, or 'knapping,' was a living industry until 1917. The mines are very similar to Grime's Graves; and, although gun-flints and tinder-lighters were the principal commodities manufactured, the methods of the artificers were not unlike those of their neolithic predecessors. Above we see (left) a lump of flint being carried from a pit; and (right) a knapper who has just detached a flake from a flint core by percussion.



MINES FROM WHICH THE FLINT WORKER OBTAINED HIS RAW MATERIAL

Grime's Graves at Weeting in Norfolk were an important centre of the flint-making industry in the Neolithic Period. They consist of pits sunk into the chalk to a depth of about thirty feet—there are said to be 346 such pits. From them tunnelled shafts and ventilation holes radiate in various directions underground; the entrances of three such shafts are seen in this model section.

From a model in the British Museum



WHERE IMPLEMENTS OF PREHISTORIC TYPE ARE STILL MADE AND USED

The Stone Age has not yet passed where primitive peoples are concerned. Most backward among these are the Australian aborigines, who still use implements reminiscent of European neolithic and palaeolithic cultures. Of a neolithic type is the axe-head which we see above being chipped (left) and (top right) when this stage of manufacture has been completed; the ingeniously hatted stone knife (with its sheath) shown below are more like palaeolithic implements.

From Spencer & Gillen 'Across Australia,' Macmillan & Co., Ltd.

As for other varieties of neolithic stone-work, it would be too long a task to enumerate the forms without number which an age of increasing specialisation in the arts of life was bringing into existence—an age, too, which was the heir of the previous ages and freely selected among traditional patterns. Indeed, it is often hard to distinguish from Upper Palaeolithic specimens, as regards their type, implements which have a definite Neolithic horizon, or at any rate are associated with pottery and the bones of domesticated animals; the explanation being in part perhaps that Capsian and post-Capsian immigration from the South brought into western Europe a tradition going back to the Aurignacian.

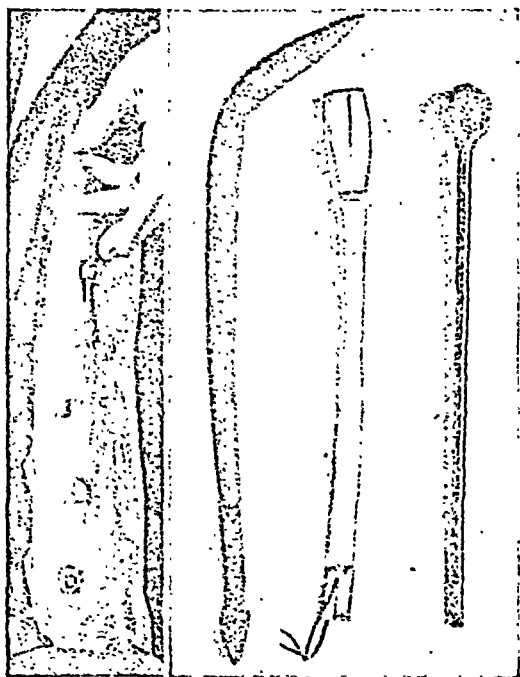
For the rest there are found in England and elsewhere plenty of neolithic implements of almost pre-Chellean coarseness, some of them doubtless unfinished instruments or rejects, while others may be for rough use in the fields as hand-picks or hoes. At the other end of the scale the Neolithic Age can compete in refinement

of execution, involving pressure-flaking and the most delicate sense of symmetry, with the best Solutrean work; so that indeed it takes the expert to distinguish the two styles.

Scandinavia, in particular, where the Stone Age seems to have enjoyed a sort of S. Martin's Summer, produced masterpieces such as the Danish hand-daggers and half-moon blades which, if we leave out of account the Solutreans and the Ancient Egyptians, no other people of the ancient world could equal or even approach.

Beauty apart, however, the Egyptians perhaps hold the palm for cleverness, since they could even chip flint into rings and bracelets. A famous flint-knapper of Brandon in Suffolk confessed to me that with all his modern tools he broke down at that point.

Mention of Brandon, with its flint industry, which includes both mining for the material—in mines similar in all respects to ancient ones such as Grime's Graves, with its tunnelled shafts and



MAN'S MOST PRIMITIVE WEAPON

A rudely trimmed sapling—like the traditional club of Hercules (left)—was probably Man's first battering appliance. Refinement and development are noticeable in the African clubs of hippopotamus hide and ivory respectively and the beaked Australian specimen shown on the right.

Photos Alinari and E. Guillon

deer-horn picks—and chipping it into the gun flints and tinder-lighters still in request in backward parts of the world, will serve, in conclusion, to remind us that even now Stone Age ways persist. They are found chiefly, of course, among savages, yet in minor matters even among ourselves; as a visit, say, to the Hebrides would very soon show.

Having reviewed the progress of the arts historically up to our allotted limit, the end of the Stone Age, we pass from archaeology to ethnology, and in the remaining half of this chapter, proceeding analytically, must consider typical arts belonging to the same general level of culture as they appear among the more backward peoples of to-day. Such an analytic treatment is the only safe method to pursue in this case, since the historical antecedents of the modern savage are mostly beyond recall; so that we cannot tell how far his present ways are genuine survivals of ancient Stone Age practices as we know them, and how far like cir-

cumstances have led him independently to converge on a like course of conduct.

Meanwhile, whereas a history takes the facts as they come, an analysis, on the other hand, must arrange its topics on a logical plan. Such a plan is suggested by the familiar contrast we are wont to draw between living and living well, work and play, necessities and luxuries, material and spiritual interests, and so on—distinctions which all suggest that there are two planes, a lower and a higher, on which mankind lives as best it can simultaneously: the plane of the body, as it were, and the plane of the soul. Correspondingly, then, the arts of mankind can be divided into two chief classes, the prudential and the liberal arts.

Some might suppose that neither Stone Age man nor his modern equivalent can have had much opportunity to develop a soul. Let them study the facts before they make up their minds on this point. Certain it is at least that in what follows we shall have as much to do with arts which in their direct purpose are not utilitarian as with arts which are; though of course it may well be true that for Man to develop his spiritual interests for their own sake is highly practical in the long run. Thus under the general head of Prudential Arts we may range such of them as relate to food-getting and food-preparing, fighting, shelter, clothing, transport and trade; whereas the Liberal Arts comprise those connected with what even in their earliest manifestations can be recognized as Fine Art, Science and Religion.

To begin, then, with food-getting. This consists at the lowest stage of culture in gathering, hunting and fishing, the former the woman's, the two

latter the man's department. Gathering need not detain us long, since

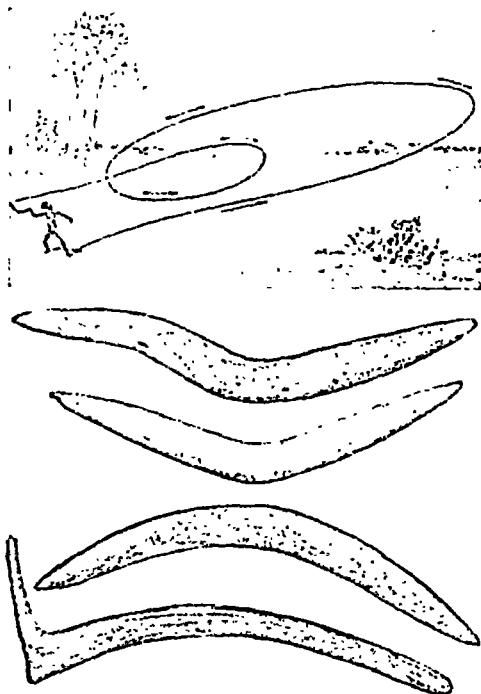
Equipment of the Food-gatherers
a stick with which to scratch and a receptacle of bark or skin or hollowed wood in which to store the seeds, berries, nuts and grubs constituting the find will suffice in the way of outfit. Hunting, on the other hand, in conjunction with fighting, which has much in common with it, provides so powerful a stimulus to human ingenuity—since kill or be killed is the principle involved—as almost to

justify the paradox that the impulse to create is child of the impulse to destroy.

Hunting gear can be classified functionally according as its object is to strike or to catch; while striking in its turn in all its varieties, such as battering, piercing, cutting, pelting, may be subdivided into striking at close quarters and striking at long range. To take striking weapons first, of course the hand, even an ape's undeveloped hand, can use stick or stone for beating or for throwing equally well, and up to a point the same instrument, whether club, spear or even knife, can serve either purpose indifferently. Specialisation, however, soon comes into play, and, since long-range work greatly exceeds short-range in the variety of opportunity offered, invention especially triumphs in the sphere of ballistics.

Of battering appliances the prototype is, perhaps, the stout sapling, plucked up with the root, which serves as the striking end; such a club, slightly adapted by trimming, appears in the traditional Greek representations of Hercules. The bosses left by such rough and ready pruning of roots and side shoots are actually serviceable for offensive purposes; and in the more developed weapons of this kind it is interesting to trace the survival of these knobs, varied in the composite type by insertions of flint spicules, shark's teeth and so on, while even decorative embellishments repeat the same theme, as in the beautiful carved maces from the Pacific.

Meanwhile, a club is capable of striking in more ways than one, and instead of

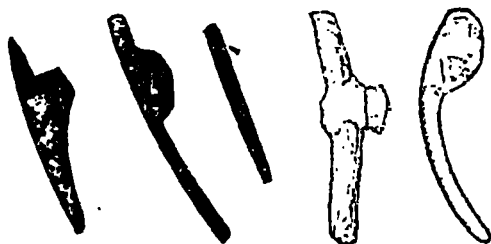


EVOLVED FROM THROWING-STICKS

Non-returning boomerangs (lower two) are commonly employed by Australian aborigines in hunting. The returning variety (upper two), although mainly toys, may be used to take prey in the rear; the diagram shows one in flight.

bruising may have a cutting edge, resembling in this case, and perhaps deriving from, the paddle of a canoe. Or, once more, a club may pierce. I have an Australian hardwood club obtained directly from a native who showed me in vivid pantomime that the curved head was meant to strike the victim round the back of the neck, and the sharp end to finish him off by pecking him behind the ear. In this instance the fashioning has obviously been done by means of a sharp stone, and the bending, together with the hardening, of the point accomplished by the aid of fire. Of course, wood is not the only material used for clubs, though doubtless it came first. Thus, I have two weapons from a central African chief's outfit, one of pure ivory, the other of hippopotamus hide, and both most formidable as well as beautiful implements. All three are illustrated in the opposite page.

As a missile the club must be lighter and of a form lending itself to the action



BOOMERANGS IN CAVE PAINTINGS

Among the weapons of palaeolithic man the boomerang should almost certainly be included, since some of the drawings of knobbed and in-curved objects represented on his cave walls resemble very closely a certain type of Australian non-returning boomerangs (extreme right).

After Breuil, L'Anthropologie

of throwing. The palaeolithic paintings almost certainly depict throwing-clubs of more than one shape, including that incurved shape which marks the boomerang class. Known in India, in Africa, including ancient Egypt, and even occasionally in America as well as in Australia, where it is a leading weapon, this type may well have descended from very ancient days, the effect of the heavier forms when sent spinning forward with an overhand action being discomfiting alike to beast and to man.

Most are of the non-returning kind, and this holds even of Australia, to which the returning kind is more or less peculiar, though Pitt-Rivers found that a model which he made of a boomerang from ancient Egypt came round and back excellently. Presumably a natural warp in the wood causing one half of the blade to deviate a little, perhaps two or three degrees, from the plane of the other directed attention to this power of orbital flight in certain implements; whereupon selection and adaptation would step in to satisfy a taste in throwing which always, I suspect, looked chiefly to the fun of the thing, as witness the delight with which the surviving natives indulge in the practice. They love to compete with each other to see who can cast in the widest and completest circle, now from the right, now with another club from the left side; while proud is the man whose boomerang not only completes its circle, but loops the loop, one or more times, as well—a result

to which a still day, the trained hand of the thrower and, perhaps chiefly, the excellence of the weapon must all contribute.

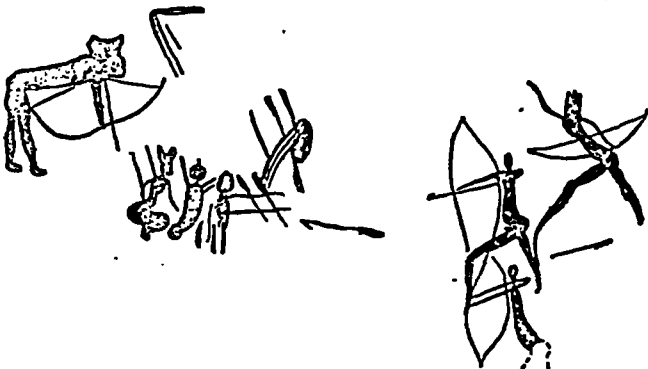
As for the utilitarian aspect, I have heard that a returning boomerang will often take a flock of parrots unawares; and a native told me himself that, by casting it from the bank of a stream so as to come up

Use of Return-
ing Boomerangs

'all same eagle-hawk' behind a group of feeding ducks, he could make them fly low along the water into the neighbouring reeds where, immersed up to her neck, his 'gin,' or wife, was waiting with a net—very much as an artificial kite is sometimes trailed over partridges in England.

Next in primitiveness among striking weapons is, perhaps, the spear, originally any stick or stake with a sharp end. According, however, to its use as a thrusting or a throwing weapon, specialisation of form soon evolves. A good point, of course, is needed in any case, and though invention supplies different materials, such as stone, bone, obsidian, a sharp end of bamboo or, finally, metal, the shape does not greatly vary, except in so far as barbs are unsuitable for a stabbing-spear, which may have to be withdrawn quickly, bayonet-fashion. The shaft, on the contrary, is subject to considerable differentiation. To be straight and to balance well are essential in the missile spear, and much experimentation alone could bring about a conjunction of these qualities.

Even so, the perfect weapon, if thrown by hand, has a carry of little more than fifty yards. Hence the importance of the invention of the spear-thrower, or 'wommera,' which trebles the effective range, or, alternatively, allows a heavier spear to be used. It has already been mentioned that this ingenious instrument goes back to Magdalenian times, the rod of reindeer horn or bone with a hook at the end being a fairly common find. As it is often elaborately decorated with figures of animals, it may have been accredited with



VIVID STUDY OF AN ATTACK BY ARCHERS

The arrow shot from a bow is a more effective, more highly developed missile than the dart, from which it was probably modified. Spanish cave-paintings of combats, such as the above, and the chase show that in the Palaeolithic period bows (of at least two types) and arrows were in common use.

After Gabré, El Arte Rupestre en España

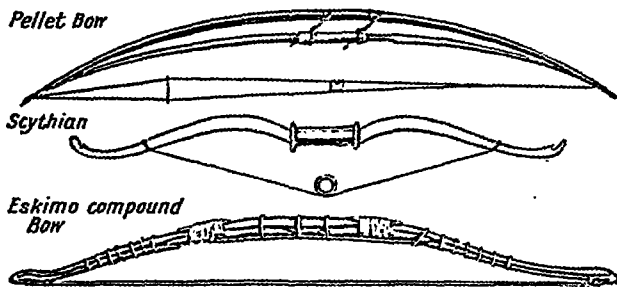
an inherent killing-magic. Certainly primitive man cannot fail to have been impressed and awed by the access of mechanical power produced by what Dr. Macalister calls 'the first machine of which we have any remains invented by man.'

The modern distribution of the instrument may possibly be explained by reference to a culture spread from palaeolithic Europe; but many links of the chain of evidence are missing. Of the two areas in which it occurs, one consists of Australia, with New Guinea and some neighbouring islands. A good many types co-exist in Australia, one being a simple rod and hook, which has the advantage of offering small resistance to the air, and the others being more or less blade-like; one of the latter kinds indeed has the tooth at the side of the blade so that this cuts through the air edgewise, but the rest, with the tooth in the face, are often quite broad. Where this occurs the notion probably is that what the weapon loses as a spear-thrower it gains as a shield.

The second area is the continent of America with a slight extension into the corner of Siberia bordering on Bering Straits. The Eskimo and other 'tundra' peoples have habits so

Distribution of the Spear-thrower like those reflected in the remains of the Magdalenians that it is tempting to postulate a historical connexion between the two; and the common possession of a spear-thrower of very similar type is evidence in point. The examples from Central and South America bear a family resemblance to the northern type, which is characterised by special attention to the handle-grip.

Meanwhile, Europe itself abandoned the rigid type of spear-thrower in favour of a flexible one, such as the javelin-thong of the Greeks and Romans, which at once increased the leverage and improved the grip. This had a loop for the fingers, was tied fast to the middle of the weapon, and flew away with it from the hand. This method survives in West Africa; but in



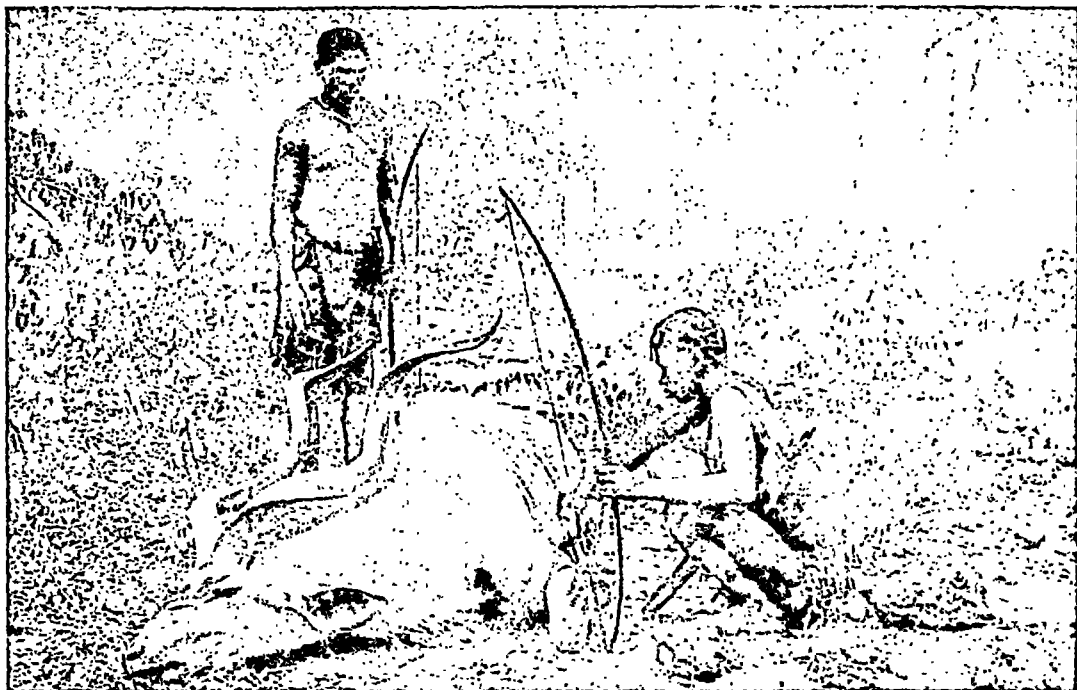
ONE OF MAN'S MOST USEFUL IMPLEMENTS

In addition to the simple bow of wood, there are more elaborate composite forms. Above is a modern Eskimo variety, constructed of bone and sinew, and an ancient Scythian bow, probably of wood and horn. The South American double bow seen here is designed to shoot clay pellets instead of arrows.

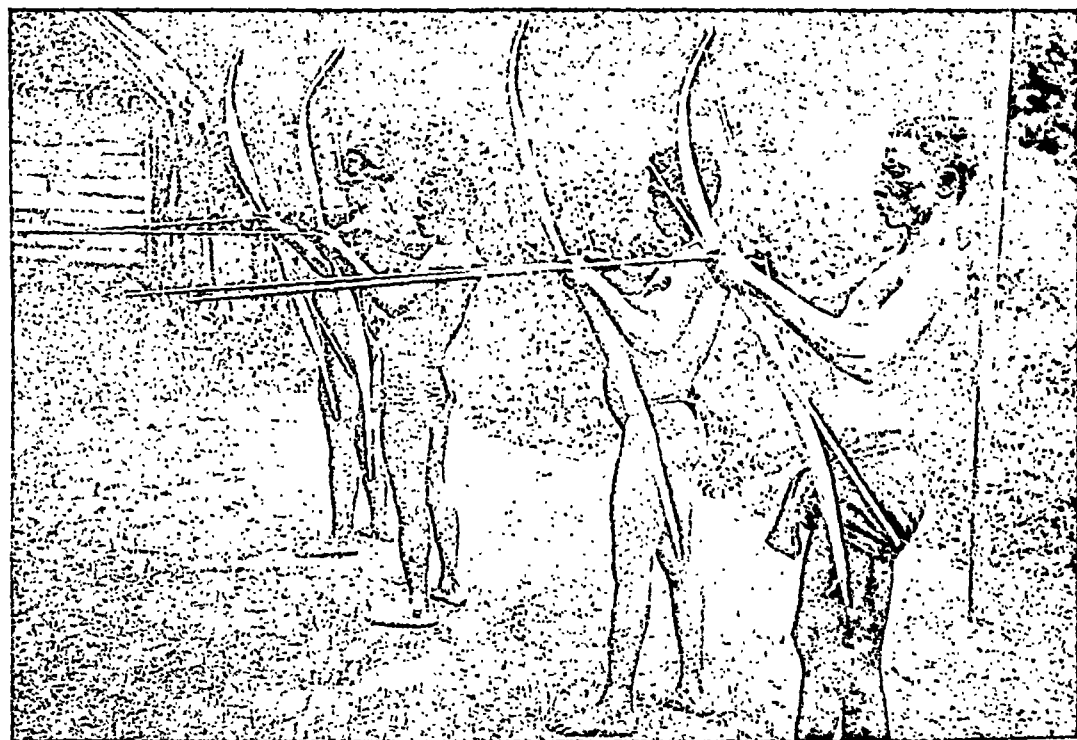
New Caledonia they know how to hitch on the string so that it is released and remains behind when the spear is thrown.

We pass on naturally to the subject of the bow and arrow; for having dealt with the spear as propelled by wood or string, we have to enquire how wood and string in combination can discharge a modified spear, an arrow being no more than a light dart which has become gradually specialised. Indeed, an arrow may be merely a sharpened stick and, as in New Guinea, lack feathers. Since such a stick as used with a plain bow of wood could leave no trace behind in a palaeolithic site, we must beware of denying the possibility of the existence of this weapon on the ground of the absence of stone or bone arrow-heads; and indeed we should not know that the Capsians had it but for their pictures. On the other hand, Tasmania and Australia—with the exception of the extreme north of Queensland, where it intrudes from Melanesia—lack it entirely, so that it looks as if the invention belonged to a rather high level of Stone Age culture.

How this invention came about we can but guess; perhaps, as Pitt-Rivers suggests, by the discovery that a dart fitted to an elastic branch makes an effective spring-trap for game. When the right sort of wood is to hand, a bow of the plain or wooden variety suffices; it may, however, be simple or compound, of one kind of wood or of several kinds, as in some Japanese examples. The other main variety, known as the composite bow, made of wood, horn and sinew glued



As enabling Man to slay surely and from a distance, the bow is pre-eminent among primitive weapons. The use of poisoned arrows—perhaps known to the palaeolithic hunters—makes it even more destructive; these Bushmen have wounded a kudu and then followed it until the poison took effect.



Very early in the long history of the bow, Man must have set about adapting it so as to give his arrows greater range and transfixing power. The modern Andamanese have achieved this purpose by making their bows in the shape of a letter S, thus increasing their 'spring'; and weapons apparently (though perhaps accidentally) of a very similar type are represented in prehistoric cave-paintings in Spain.

SPECIALISED TYPES OF BOWS IN USE AMONG PRIMITIVE LIVING RACES

Photos, Denver African Expedition and W. A. Usher

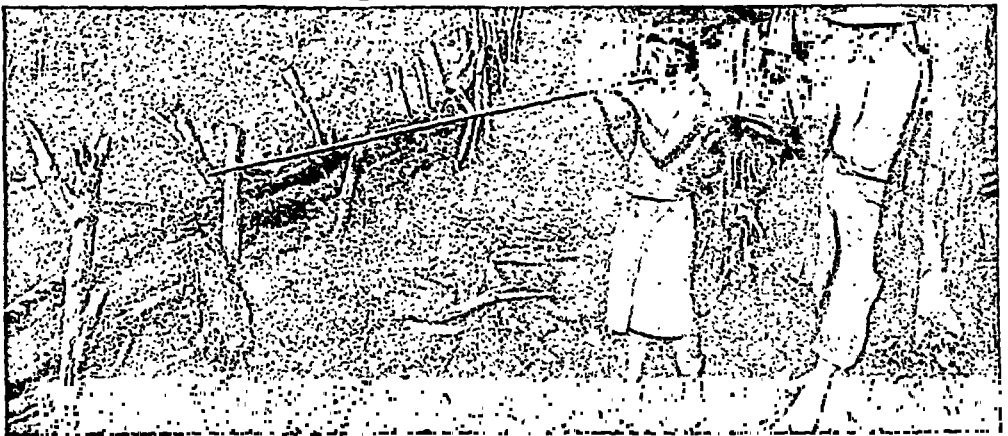
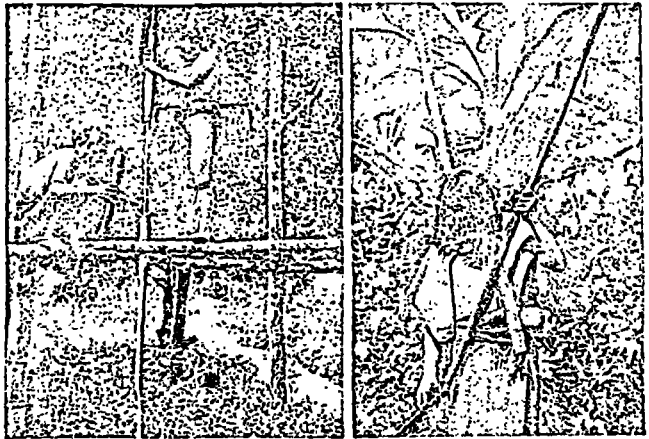
together and perhaps covered by an ornamental casing of birchbark or lacquer, is characteristic of the whole steppe-region of Asia from Turkey to China and presumably originated in a region where wood is scarce.

The Eskimo, having to use driftwood or reindeer horn, provides the necessary elasticity by means of a backing of sinew which is simply lashed in position, a process more rudimentary and hence perhaps earlier than the Asiatic plan, found also in America, of moulding the sinew to the wood. Meanwhile, an advantage of the composite bow is that it can be made to combine great strength with moderate size, and hence lends itself to use from horseback. Thus armed the Parthian archers were the terror of the Roman soldiery, and one of Napoleon's generals recounts how he was wounded by a mounted Cossack who had nothing better than this bow to oppose to the French musket.

One might also make mention of certain unusual forms of the bow, as for instance the S-shaped plain-bow peculiar to the Andamans and New Hebrides, or the reflex type of composite bow in which the ends are pulled right over into

the opposite direction in stringing—no easy job. The cross-bow, however, need not detain us, since, although it is found among savages both in south-eastern Asia and in West Africa, the chances are that its invention is due to rather more advanced folk whose ideas they have borrowed.

The pellet-bow, on the other hand, is interesting because it introduces a new mode of striking—pelting instead of transfixing. The string is furnished with some sort of bag for holding the bullet, which is usually a small pebble or lump of hardened clay; and, if he can avoid hitting his own thumb, the hunter can make short work of small game. The distribution of the instrument is perplexing, because, while found in the south-



HUNTERS OF TWO HEMISPHERES WHO SLAY WITH THE BLOWPIPE

Among the ingenious killing devices invented by primitive man is the poisoned dart shot through a blowpipe. Here (top, left) we see Bornean tribesmen boring a solid wooden pole to make a blowpipe; the finished weapon will be very similar to those used by the Jivaro of Ecuador (below) and the Peruvian Indian (top, right). The latter is inserting a poisoned dart into his blowpipe.

Photos, Dr. Charles Hose, G. M. Dyott, and H. E. Anthony

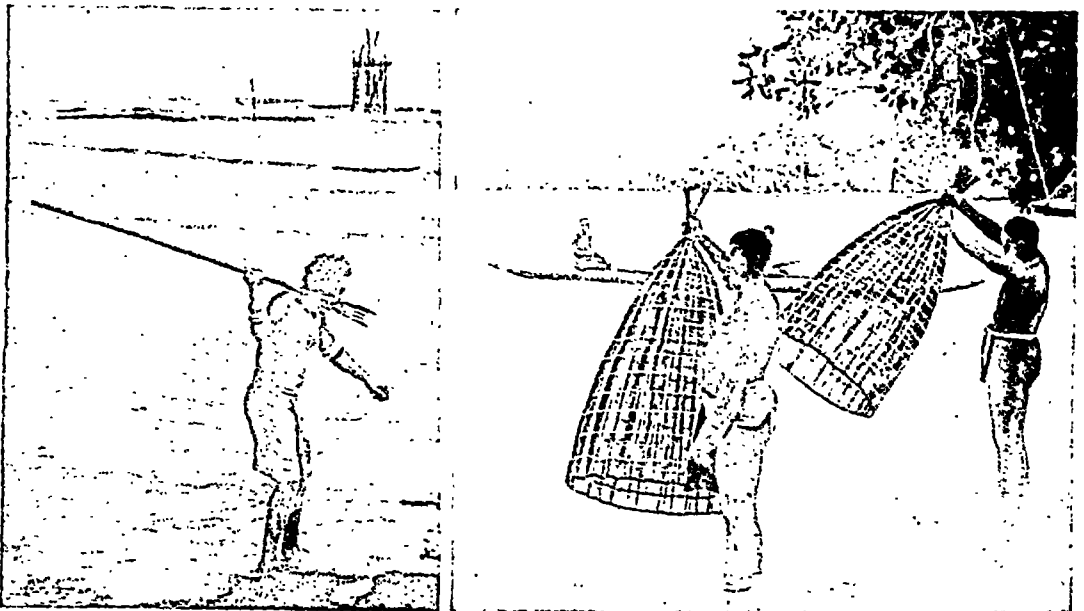
east of Asia from China as far as India, it occurs again in South America and is thus a bone of contention between those who assert and deny that Asiatic influences found their way to America across the Pacific; denial involving the view that the pellet-bow was invented twice over.

Reverting from pellet to arrow, we may next note that a weak bow and correspondingly light arrow—a mere dart, in fact, such as the Bushmen used—will serve the hunter's purpose if he make it the vehicle of a poison. The Bushmen used the venom of various snakes and caterpillars, an invention depending on direct inference. Most primitive peoples, however, use vegetable poisons, such as aconite in the Old World and curare in the New, and much experimenting with things to which magical properties were attributed, many of them of no real efficacy, must have led on to the selection of the most deadly principle. Meanwhile, any weapon—a spear or harpoon, such as the Magdalenian harpoon, perhaps, with its grooved head, or a dagger suitably perforated, or even, it is reported from some South American tribes, a thumb-nail—will convey the infection, so long as it draws blood.

Hence, from the spear through the arrow we reach the tiny poisoned dart which, wadded at its base with pith or cotton to fit the tube, is discharged from a blowpipe. With one of these weapons, nearly twice as long as himself it may be, and sometimes furnished with a sight, the Indonesian can slay the largest beasts. Such an invention, indeed, is entitled to rank with the boomerang, the spear-thrower and the bow as a first-rate achievement of primitive man.

In South-East Asia a bamboo or reed makes a natural tube, though the nodes tend to interfere with the smoothness of the barrel, despite efforts to shave them down; so that the Bornean method of boring such a gun out of solid wood, though infinitely laborious, is perhaps found paying in the long run. In Guiana and the Amazon region, which is the other chief area in which the blowpipe is found, they are clever enough to scoop out the tube in two halves, which are then stuck together. With such an instrument they achieve very high as well as long shots in the tropical forest, and it makes no noise.

Not to deal here with cutting weapons, which have less to do with hunting than

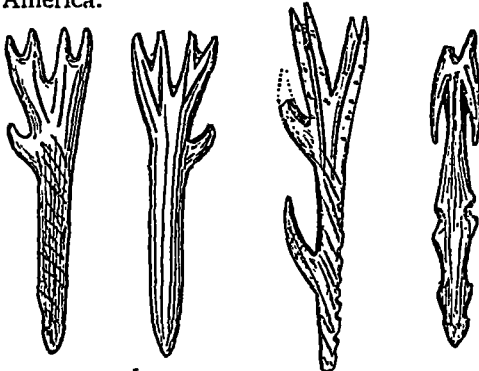


HOW MAN'S INGENUITY HAS MADE HIM A SUCCESSFUL FISHERMAN

Palaeolithic man had already discovered how to modify certain implements of the chase so as to make them suitable for fishing. To-day, the equipment of the fishermen of the Solomon Islands largely consists of implements similarly adapted. Above (left), for example, we see one of their many-pronged fish-spears in use; and (right) a group of islanders with traps for capturing fish.

Photos, Douglas Rennie and A. Turnbull

with fighting—though strictly the sharp projections and serrated edges of clubs and spears are for cutting rather than piercing—we may note that another form of pelting is by means of the sling, a very widely distributed device, though not known to Australians, Bushmen and other very primitive people. Entangling, however, rather than striking is the object of the bolas or stone balls, attached to a length of string which their weight causes to enwrap the object struck. The Eskimo have a device for catching puffins in which no less than seven or eight weights of stone or ivory are affixed to cords of sinew tied together at the other end, so that the instrument flies out like a fan, covering five or six feet. The lasso or throwing noose is an even more purely entangling weapon, and like the bolas is almost entirely confined to America.

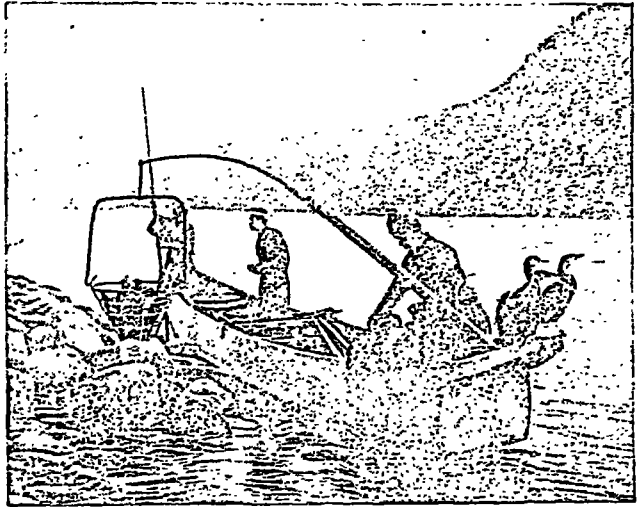


PRIMITIVE BONE FISH-HOOKS

We have no definite indications as to the true function of certain small, barbed implements of bone—some specimens are shown above—found in Magdalenian deposits. It is very probable, however, that they are fish-hooks or 'gorges.'

After Cartailhac and Breuil

The entangling of prey in running nooses, nets and so on enters largely into the art of trapping, a subject too vast to be examined here, though the technical ingenuity involved in these and other trapping methods, as by pit, palisade, falling weight and so on, is considerable, and was doubt-



SEA-BIRDS TRAINED TO SERVE MAN

In the Far East, tamed cormorants are commonly employed to catch fish. Several of these birds are here seen perched on the stern of a fishing-craft on the Nagara river, in Japan. When sent into the water, the cormorants have a ring round their throats so that they cannot swallow their prey.

Photo. Rev. W. Weston

less exercised in Palaeolithic times, even if the interpretation of certain symbols as different kinds of snare is unduly sanguine. Nor can any sketch of primitive hunting be complete without allusion to man's success in appropriating the services of the dog—who goes back as a domestic animal to the Danish kitchen-middens and is perhaps recognisable in the Capsian rock drawings—a hunting-companion with whom no other animal ally, cheetah, ferret, cormorant, hawk, can compare in value.

Fishing in some form is a well-nigh universal and very primitive art. At its lowest it may approximate to gathering rather than to hunting, as among the Tasmanians, who knew neither the fish-hook nor the net; the spoil of the sea took for them the form of shell-fish which the women scraped off the rocks with a wooden chisel, often diving deep for the purpose. On the other hand, as a specialised type of hunting, it develops elaborate implements and methods; and naturally, seeing that it may become the staple industry of a whole people, such as the salmon-fishing tribes of North-West America.

Up to a point the hunter's weapons likewise serve the fisher, who similarly uses spears and arrows for striking, and nets

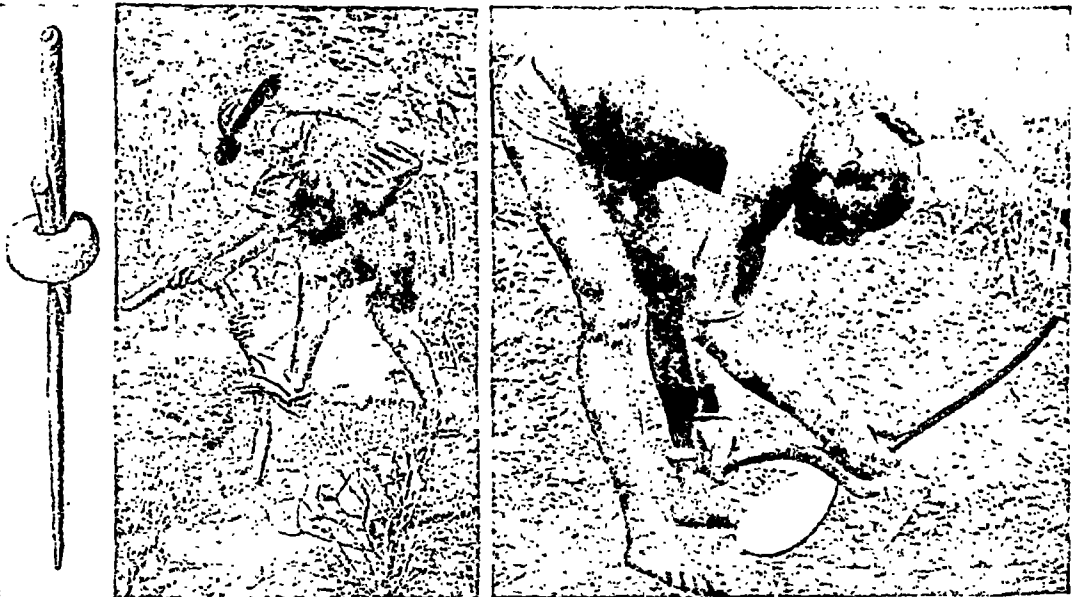
and traps for entangling. Water tactics, however, are sufficiently different from land tactics to introduce important modifications of form—the many-pronged fish-spear, for instance, or the detachable harpoon-head, not to speak of fishing-nets and fish-traps of infinite variety. Or again, if poisons are used to stupefy fish, they are special poisons; or, if animal allies assist, they are special animals, the cormorant with ringed neck, the frigate-bird, the otter, the lined sucker-fish which finds the turtle; the rarity of such experiments causing one to wonder whether man has really explored all the possibilities.

Apart from the art of diving, so well developed in tropical seas, the method most peculiar to the fishermen of all the world is the use of the line, with or without a rod, and ending in a noose, or more usually in some attachment for securing the prey, be it hook or gorge, which in order to attract must be cunningly baited, or at least be made of shining material. Prehistoric man enjoyed his salmon and trout, as Magdalenian pictures attest, but not much remains of his fishing gear, as there is little profit in trying to make a hook, still less a barbed hook, out of flint; though I have seen one made at Brandon

which caught a fish in the Suffolk Ouse. There are, however, barbed bone implements of Magdalenian age that may be fish-hooks, and small rods of bone and ivory, sharp at both ends, which are not unlike the gorges used by the Eskimo; these, tied in the middle, come up across the fish's mouth when the line is pulled.

Of special areas with specialised fishing methods the most interesting is perhaps one extending from Indonesia to Melanesia. Here is found the fishing-kite, with its spider-web lure, which the kite causes to trip lightly along the water like a well-cast salmon-fly. Or, again, the Eskimo, who in many other ways is so well adapted to his harsh environment, has endless methods of dealing with the fish and other water animals on which he largely lives; unerringly he strikes the seal from his canoe with a harpoon, discharged with the spear-thrower and with bladder attached to mark the place of the kill; or, from a larger canoe, even drives the huge whale ashore after a dozen hunters have together fixed their harpoons in its sides.

As for the more advanced modes of food-getting involved in the pastoral and agricultural conditions, they fall rather outside the present chapter; though of



HOW THE SOIL IS TILLED IN UNCIVILIZED COMMUNITIES TO-DAY

Primitive agricultural implements of to-day help us to realize the kind of gear owned by prehistoric cultivators. The digging-stick, for example, preceded the spade; an ingenious type (left), weighted with a stone, is still used by Bushmen. Ancient hoes possibly resembled the very rude variety (centre) that yet serves the Bolivian Indians, or the more elaborate modern Nigerian hoe (right).

course it is true that it was the Stone Age that discovered how to get beyond the Stone Age. How the domestication of animals and plants came about we can but guess. Doubtless woman had a good deal to do with it. She probably made pets of small animals as a by-product of her mothering impulse; and to-day among the Australians the dingo, the sole mammal except Man of long standing in that land of marsupials, and almost certainly Man's companion on his first arrival, is more a pet than a useful adjunct to the hunter. Again, as gatherer-in-chief, she may have been the first to notice that when casually dropped the wild seeds sprouted in her untidy middens.

For the rest the pastoral life may well have developed first in Northern Asia, unless palaeolithic Europe was beforehand with the taming or partial taming of the dog and the reindeer—a process completed whenever these were broken in for sledge-transport. (See, however, page 217.) If traction and, later, riding were by experimentation with other animals improved into primary arts of life by male endeavour, milking would seem rather to have come from the female side as being an extension of the foster-mother idea.



USED BY THE NEOLITHIC REAPER

It may safely be presumed that the crescent-shaped flint implements discovered in neolithic remains from Egypt to England and Denmark were used as sickles. At best they are clumsy; all have the saw edges seen in those above.

From the British Museum

So much for the results of bare conjecture, eked out by uncertain attempts to discover the habitat of each wild species of animal and plant from which the domesticated kinds are derived.

As regards implements, the outfit of the purely pastoral tribe is meagre, being limited to what is portable, since the life is nomad. Agriculture, on the other hand, since the grower must at least stand by



FIRE-MAKING BY FRICTION

The Australian aboriginal kindles tinder with the smouldering sawdust produced when a hardwood spindle-stick is made to revolve upon soft wood (lower). Certain African natives also use a drill-stick and a fire-stick (upper) to the same end.

Spencer & Gillen, 'Across Australia,' Macmillan & Co., Ltd.

while the crop is in the ground, tends to be sedentary, so that gear can be accumulated. The digging stick, which perhaps as among the Bushmen has a stone ring to give weight to the head, has only to be broadened out and sharpened at the end to become a spade; which in the metal age develops first a rim and then an entire blade of the harder substance. An even more important instrument is the hoe, at first perhaps a stone pick held in the hand, then by hafting adze-fashion converted into a hacking-tool.

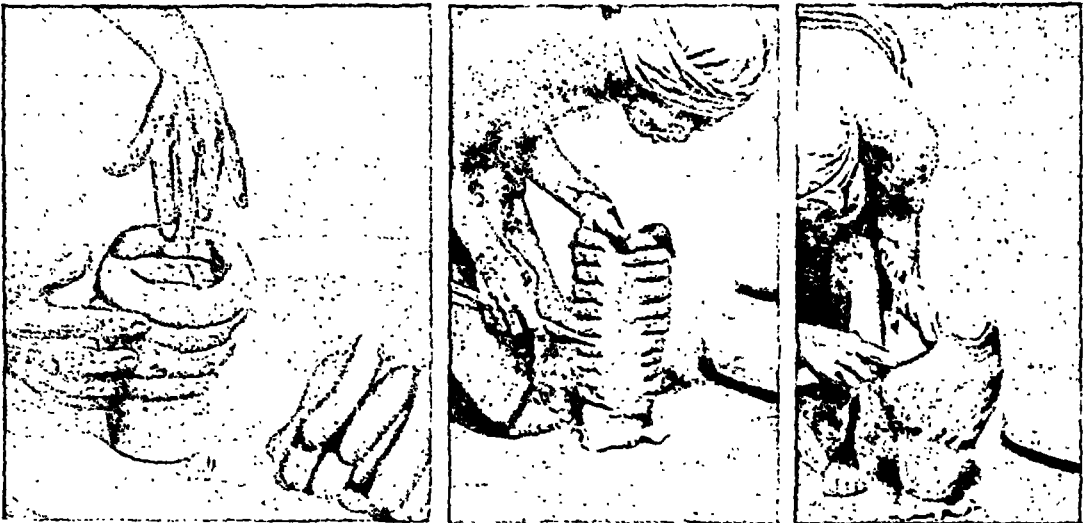
Hoe culture, which is usually woman's work, is typical of savagery. With the dawn of civilization comes plough culture, when agriculture is reinforced by the traction of pastoral animals and the male now condescends with their aid to direct the plough, a sort of glorified hoe, along the furrow. Reaping is a difficulty before the use of metal, and is carried out with flints, usually anticipating the shape of the sickle, but with saw-like edges, which are retained for a time when metal comes to

be used. Other processes such as threshing and winnowing also call appropriate instruments into being.

Having gathered or caught its food, the animal eats it. Not so Man, who must in most cases cook it first. Fire-making is an art that goes back at least to the earliest cave-men. Iron pyrites is found in Mousterian deposits, and as the Fuegians obtain fire by striking together two lumps of pyrites, such a percussion-method may have been the oldest way of artificially producing fire, especially as it would be a natural by-product of a stone-

one frictional method, characteristic of Oceania. Sawing, as when an Australian scrapes his spear-thrower across his shield, or when, from Malaya to Melanesia, a flexible strip of bamboo is used, is another quite effective way. But the commonest plan is to twirl the spindle-stick with the hands. I have seen an Australian produce fire in this way in under half a minute; though with the very appliances that he had used I could myself by no means approach his record.

Increased rotation is produced by the thong-drill of the Eskimo, or by their bow-



STAGES IN THE MAKING OF AN EARTHENWARE POT IN WEST AFRICA

Many living races make their pottery after the primitive fashion followed by this native of Sierra Leone. Rolls of clay are built up on a solid base (left), and, when the required height is reached, the outside is scraped smooth with a stick (middle). Thereafter, the pot is given symmetrical form and the neck and spout are carefully formed (right); baking in a kiln completes the process.

Photos, Northcote Thomas

chipping age. Of course Man may have used it earlier still, having obtained it from a volcano or from a tree set on fire by lightning; and, before he knew how to create it, may have carried it about by means of a fire-brand, like Prometheus, who stole fire from heaven in a reed. The Andamanese have fire, but are unable to make it.

A great benefactor of the race was the discoverer of the frictional method. The principle is always the same, namely that rubbing one piece of wood on another quickly enough will start a spark in the sawdust. Perhaps it was found out accidentally in the course of trying to bore a hole through a soft bit of wood with a harder stick. Pushing along a groove is

drill, which is an improvement on the thong-drill, since it can be worked with one hand instead of two. Finally, in Indonesia they discovered, perhaps in the course of making blowpipes out of bamboo, that by driving a piston home into a bamboo tube a spark will be generated in tinder placed at the bottom. This compressed-air method concludes the list of primitive ways of making fire unless one includes the use of a concave mirror, whereby the ancient Mexicans obtained fire from heaven on ceremonial occasions.

Methods of cooking provide a large subject which must be merely glanced at in passing. Despite the popular belief to the contrary, the savage much prefers his

food cooked to raw, and even his cruder methods, such as baking the meat encased in clay over hot stones, the whole well covered over with earth—a plan often adopted by our gypsies—yield savoury results; while when the pit-oven has been evolved, delicacies both animal and vegetable are produced which the white man has often been glad to copy.

Hot water is more of a difficulty, owing to the want of a receptacle that will stand the fire. For this purpose the more

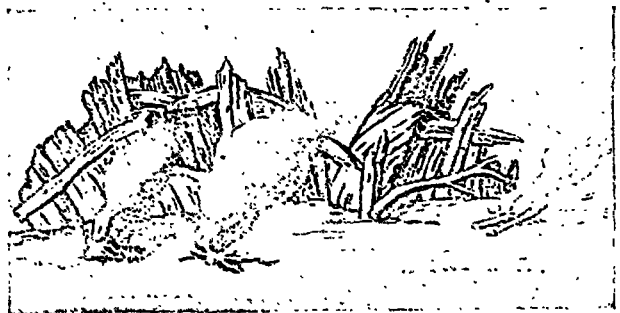
primitive folk use calabashes, wooden bowls, Primitive Cooking skins, water-tight baskets and so on, and the 'stone-boiling' method of throwing in hot stones has to serve. As for basketry, which in its two main forms is either woven, or coiled and then sewn—though there are numerous sub-varieties such as those that may be studied in the admirable work characteristic of western North America from Alaska to California—it has the advantage of providing more or less nomad peoples with vessels that are both light and will not break. Though a really well made basket will hold water, it is advisable to reinforce it with an exterior coating of clay; and it may have been by discovering that such a containing shell on exposure to heat became fireproof that the idea of pottery arose.

This is indeed one of the ways in which the primitive potter proceeds, namely, to build up his clay round some object, a wicker-work frame or a gourd; though the drawback is that the object in question suffers when the pot is fired. A commoner and better method is to hollow out a lump of clay, shaping its inside with a stone and its outside with a mallet; or else to make a disk for the base and carry up the walls by adding strips, which when long are carried round in a spiral coil. These spirals are easily smoothed or beaten out when the vessel is complete, though they may be retained for the sake of ornaments, as found in some examples of Pueblo ware.

The decoration of pottery, however, is too vast and intricate a subject to enter into here. Nevertheless it may be noted that some primitive band-patterns are but reminiscences of the marks left by a rope or a plaited band such as may be tied round the pot to support it during the baking. For the rest, pottery up to the invention of the potter's wheel is, like basketry, woman's work, and this should be remembered to her credit when we contemplate the beautiful developments of ceramics, not indeed found among the rudest peoples, but associated with those who have just left savagery behind and are at that intermediate stage of culture which is termed barbarism.

To pass on to fighting, this activity on its offensive side draws largely on the same types of weapon as does hunting: club, throwing-stick, spear, arrow being but slightly modified for purposes of war. The axe, which otherwise is more of a carpentering than a hunting implement, develops into the battle-axe chiefly after metal has come into use. Metallurgy hardly comes within the scope of this chapter, but in the present context a word may be said about the development of cutting instruments, such as tend to encourage the hand-to-hand organized combat—the most deadly form of fighting, at any rate in early times, and one to which very primitive folk are not prone.

A piece of raw copper, hammered cold, as by the Eskimo, is no great improvement on the stone celt which it slavishly copies.



POOR SHELTER AGAINST TASMANIAN WINDS

Whether habitations may not have developed elsewhere from an effort to reproduce a cave in a caveless region it is impossible to settle; certainly the Tasmanian wind screen is the most primitive protective structure of which there is evidence to-day. It was made of slats sloping away from the wind.

After a photo by E. J. Manly

When bronze is invented—or one might perhaps say discovered, since tin occurs with copper in natural alloys which do not, however, provide that 10 per cent. of tin which is the optimum admixture—casting in moulds either of clay or of stone, single or preferably double, enables a hard-edged weapon such as the palstave to be constructed; together with suitable fittings, flange or socket, for firm attachment to the haft, which was always a weak point with the stone axe.

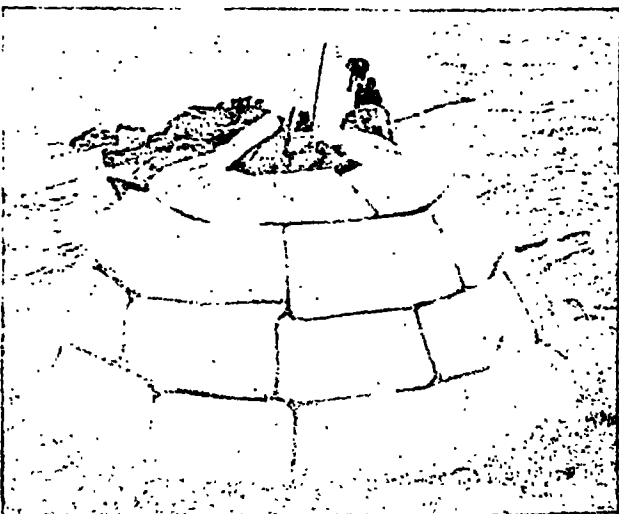
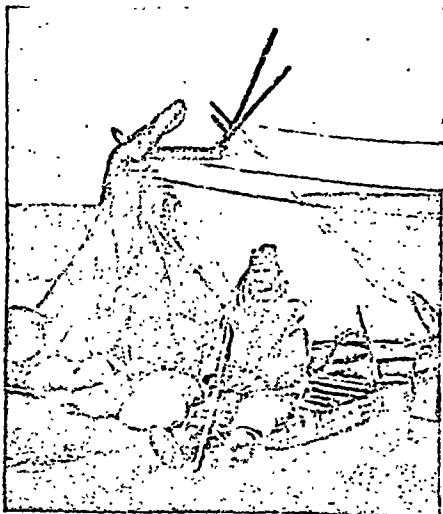
Special to war, again, is the whole large class of defensive appliances. Lacking a tough hide, Man has been forward to utilise the hides of other animals in the way both of shield and cuirass. Curiously enough the value of the turtle's carapace as a buckler is a hint from nature of which he does not seem to have taken much advantage. The light parrying-sticks of Australia testify to active as contrasted with passive self-defence, an art which the natives have cultivated to perfection.

The helmet develops from the head-dress, which originally is meant to frighten at least as much as to protect. Thus the traditional lion-skin of Hercules proclaimed him equipped with the lion's virtue; and indeed a great part of the warrior's outfit is magico-religious rather than utilitarian in its prime intention. This,

however, as well as many other aspects of the art of war, must be passed by; as, for instance, the whole subject of the trophies of war, including those gruesome spoils of the head-hunter which fill our ethnological museums.

Shelter, the next of the primary needs of Man which the prudential arts subserve, should be considered in close relation to war, as the defensive value of a site for habitation must have influenced selection ever since the right to a snug cave was disputed with the cave-bear. The history of fortification has quite an intricate first chapter, since even primitive warfare necessitates the choice of special situations, hill-tops, swamps and so on, and the use of special devices such as stockades, earthworks, ditches and pile-dwellings, whether on land or in the water.

As for shelter from the elements, the Tasmanian wind-screen or Australian 'wurley' is hardly more adequate a dwelling than a hare's form. Nomad conditions, however, especially if unassisted by animal transport, preclude anything more substantial than such a tent as can be put together with the help of a few poles and some skins, mats or pieces of bark. Thus the Eskimo when hunting during the summer uses a flimsy



SUMMER AND WINTER QUARTERS AMONG THE GREENLAND ESKIMO

The famous igloo of the Eskimo is not, as is often thought, his normal dwelling, for Eskimos do not live in regions where there is frost the whole year round. In the summer he stretches seal or bear skin over a frame of whalebone (left), and only in winter builds from blocks of compressed snow, usually laid in spiral courses, the beehive-shaped hut or igloo seen on the right.

Photos, E. N. A. and Vilhjalmur Stefansson



WHERE A HUNDRED AND TWENTY FAMILIES LIVE IN A SINGLE HOUSE

The closest parallels that may be observed to-day to the one-time 'long house' of the Iroquois Indians are the similar structures of the Kayans in Borneo. These, which may be 400 yards in length, consist of a long roofed veranda serving almost as a village street, out of which open rooms each the abode of a different family, to the number of about a hundred and twenty.

Photo, Dr. Charles Hose

lodge of skins stretched over whalebone. In the winter, however, he settles down in his warm if stuffy 'igloo' built of blocks of snow laid in spiral courses, or else digs himself a pit-dwelling six foot below ground and domed a little above ground-level with earth supported on whale-ribs or driftwood.

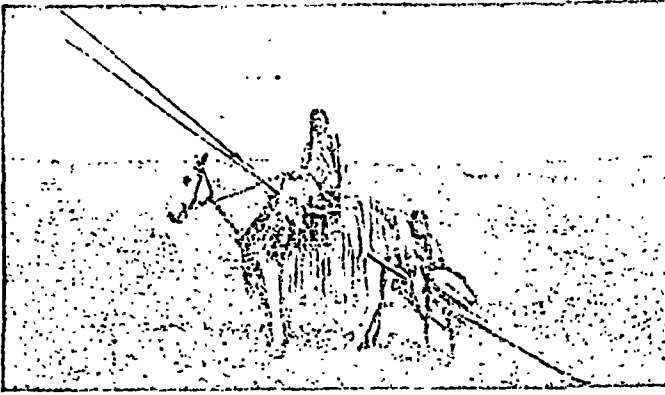
Farther south the Indian dwelling, whether the portable tent or 'tipi' of the plains or the fixed hut or 'wigwam' of the more sedentary tribes, was a humble affair if intended for a single family. The 'long house,' on the other hand, which sheltered a number of families, as among the Iroquois, might be 100 feet in length, and was stoutly constructed of poles covered with brush matting. Meanwhile, the Pueblo or Village Indians, using the sun-dried brick known as adobe, built structures of many cells and storeys, the lowest storey being a more or less blank wall which one scaled by ladders that could be drawn up in times of danger. The elaborate stone buildings of Mexico and the other regions of high culture in America are perhaps no more than developments of this hive-like type of architecture. These examples, taken from one continent, will suffice

to illustrate the variety of the domestic forms of habitation.

To house the spirits of the dead, or the gods, with due regard for their comfort and dignity is an idea that may well have grown out of the practice, dating from Mousterian times, of burying the dead man in the floor of his own cave-dwelling. In the end, however, it comes to entail a host of special constructions outside the scope of this chapter.

Clothing may seem at first sight to be an elementary need of Man, but it is possible that self-decoration, with attractiveness to the other sex as a conjoined motive, is the mainspring of the effort to improve on nature's garb. We have only to think of the Capsian rock-paintings, where the men sport magnificent head-dresses, armlets, anklets and so on, but are otherwise stark naked; while the women, if more fully attired, can scarcely be supposed to have taken to skirts because they felt the climate more.

Even conditions of extreme cold do not make warm garments a necessity for our species; since, whereas the Eskimo of the Arctic rejoices in heavy furs, the Fuegian braves the Antarctic blasts with no other protection for his bare person



HOW AMERICAN PRAIRIES WERE CROSSED

Formed of two tent-poles lashed together in front of the saddle and joined with a cross-bar or rolled-up tent behind the horse's crupper, the 'travois' of this Alberta redskin is one of the most primitive forms of animal transport. Before the horse reached America dogs were used for the purpose.

than a skin slung to windward as a screen. And as climate will not account for the degree in which a primitive people is clothed, so neither will the general state of their culture; Africa, for instance, being far more addicted to nudity than North America, though comparing favourably with it in the matter of social development.

As regards the leading processes whereby clothes, as contrasted with ornaments, are made, we may put aside feather-work, bead-work, quill-work and so on as ministering to the latter interest, and attend solely to two types of industry, namely, leather-work and weaving. To take leather first, the skins of animals are in almost universal use as a covering against the weather or as armour; while tents, boats, harness, boxes, cradles, shields, in fact a good half of the entire gear of the savage, will usually be found to involve this material, to which every beast of reasonable size contributes.

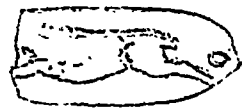
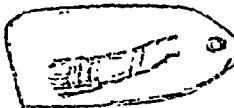
Skin dressing is a rather elaborate business. The multitude of implements of the scraper class with a more or less specialised form, in which a prehistoric site abounds, can be referred, by analogy with the ways of the modern savage, to the different requirements of each stage in an operation which includes stripping, scraping, rubbing, pounding, squeezing, drying, dressing in various ways as by tanning, greasing or smoking, and finally softening, which may be assisted by

unlimited chewing, as among the Eskimo women. For sewing leather the bone needle is ineffective, but the awl can produce quite neat results. For footwear, apart from occasional experiments such as the grass sandal, leather is in general demand, and from the mere bag of hide the sole sewed to an upper of softer skin has developed; though, on the whole, it is remarkable how many peoples of considerable culture retain the barefoot habit.

Next, as regards weaving, it may be noted that in the broadest sense this term

covers the production of all textiles, including basketry, mats and wicker-work. We may, on the other hand, confine it to meaning the work of the loom. The first step toward this mechanism is to hang the warp on the branch of a tree, from which it is an easy step to set up poles supporting a warp-beam. Sometimes the weaver's fingers suffice to introduce the weft strands, as in the case of the beautifully-patterned Chilkat blankets from Alaska; but various artificial aids—the shuttle, originally a mere stick round which the thread is wound so as to pass it through the warp, the weaver's sword or else a comb to drive back the weft threads, and so on—are gradually devised.

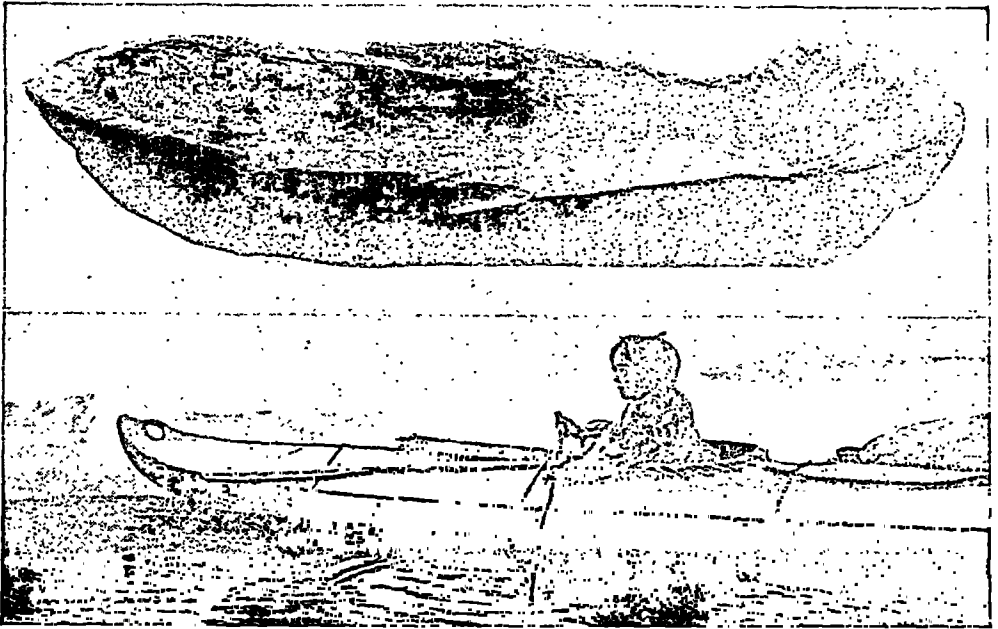
To pass to the subject of transport, this too is a primary need of Man, especially



SLEDGES IN PREHISTORIC EUROPE ?

A comparison of these two objects—Magdalenian pendant three-quarters actual size and an Eskimo sledge—will show that it is not fanciful to think that Magdalenian men used sledges. Cross-bars and upturned runners are clear on the pendant, which has a reindeer on the reverse.

After Prof. Breuil



TWO OF MAN'S MANY SOLUTIONS OF THE WATER-TRANSPORT PROBLEM

Boat-building throughout the world has had to adapt itself to whatever material was handy. The dug-out, of which we give a neolithic example found near Ryton on the Tyne, is characteristic of wooded country; in the treeless world of the Arctic the Eskimo builds his kayak (below) of skins on a framework of driftwood or bone. Other solutions have involved the use of reed bundles.

when he is more or less of a nomad and must carry about with him the whole of his earthly possessions. It is mostly the woman's job at this early stage to load herself up with the household chattels, including the baby, as the man has to keep his hands free to use his weapons against wild beast or human foe.

We seem to discern sledges in some prehistoric designs, but cannot tell whether these were hand-drawn affairs, or whether

the idea of harnessing some sort of drag to dog
 Methods of land transport or reindeer had yet occurred to the hunter. The

toboggan lying flat on the ground is hardly more rudimentary in conception than a couple of trailing sticks with cross-bars, out of which, more especially when ice-work was contemplated, the sledge with runners would develop, a contrivance which among the Eskimo becomes a miracle of neat and effective workmanship.

The travois of the Prairie Indians, on the other hand, first used with the dog, but with the horse as soon as the latter was introduced by the Europeans, was but a

two-pole drag, being sometimes hardly more than the rolled-up 'tipi' or skin-tent tied on the top of two bunches of tent-poles. Apart from freighting-purposes, however, such conveyances are soon found useful for the transport of the aged, sick, wounded, children and puppies; so that riding presently comes into view as a distinct ambition for art to oblige.

The wheel, peculiar to the Old World, probably develops out of the wooden roller used for the transport of stones, as by the megalith-builders. It would be noted that the centre could be conveniently pared down till the axle in one piece with its solid wheels, as still to be seen in Asia Minor, would emerge. Then at last, becoming lighter, the wheel would be made to turn on a fixed axle.

Turning from land to water, we do not know who it was that first tried to cross a stream on a log, but the use of such a float, probably at first not so much a vehicle as an aid to swimming, would easily develop into the raft, which is no more than a compound float—at any rate until the mere platform, at water level and consequently uncomfortably wet, is

supplemented with some erection designed to surround the passengers with a sort of water-tight screen.

To a large extent the form of the early boat is governed by the material available. The Eskimo has to depend on skin for his 'kayak' or for the larger 'umiak,' the women's boat. Farther south, where the birch grows, the Indian uses the bark-canoe, hardly suitable for more than river-work. The dug-out, again, pre-

supposes a stout log, and even where nature provides the largest trees an upper limit is reached

which forbids development on the scale attained by the plank-boat. The latter may have developed out of the custom of adding a gunwale to the dug-out to increase its size and make it more seaworthy, until the accessory technique took charge of the construction from top to bottom. Dug-outs, by the way, go back at least to Neolithic times. The outrigger canoe, which extends from India to the Pacific, may have originated in the joining of two dug-outs together.

The subject of trade connects naturally with that of transport, since to be able to exchange goods implies a power of moving a certain superfluity of stock. At this point, however, we are perhaps across the border-line that divides strict need from the pursuit of enjoyment, as the evidence seems to show that prehistoric man was at least as prone to treat himself to imported luxuries, such as shells or amber for his person, as, say, to a more workable kind of flint for his tools.

The history of exchange has an important aspect which cannot be dealt with here, since it relates to the spiritual side of the transaction, namely, to the establishment of friendly relations between different groups of normally hostile men. What is known as the silent trade, where each party deposits something that he is prepared to barter in a neutral spot, and the tacit haggling is concluded when each carries off what the other has offered, illustrates the difficulty of coming to an understanding with the stranger.

For trading purposes a great step in advance is made when such understanding takes the form of a recognition of a stan-

dard value, to which more uncertain values can be referred, so that a medium of exchange or currency comes into use. Thus any raw material in universal demand, such as tobacco, tea or salt, and especially metal such as copper or iron, provides a currency when made into sticks, bricks or bars representing a more or less definite amount. Even in primitive Australia red ochre seems to have a sort of currency value. The domesticated animal, again, among all pastoral peoples, affords a ready way of calculating the price of a marriage or of a murder, as is shown by the very derivation of the word pecuniary from the Latin 'pecus,' cattle.

All these, however, are useful objects, whether exchanged in their natural state or in some manufactured form, as when metal in the shape of hoe-blades, knives or armlets is so used. Of ornamental objects, shells have the greatest vogue as currency, though there are other possibilities in this direction, as Melanesia proves, where not only strings of shell-beads, but whale's teeth, feather-work and so on are also in circulation. Most famous of all shell-currency is the cowrie, which, though native to certain small islands in the Indian Ocean, counts as money in Asia as well as right across Africa.

For the rest, a recent study by Dr. Malinowski of the so-called trading-voyages of the Melanesians shows that economic reasons as we understand them do not inspire them so much as motives, very hard for us

Mankind and the
Liberal Arts

to follow, concerned with the honour and the luck that attend the giving and receiving of objects of ceremonial value, such as certain necklaces and armlets of shell. It looks as if even at the primitive level Man is aware that the good things of life include more than the supports and comforts of physical existence. To this other aspect, then, of the arts as aiders and abettors of his nascent spiritual nature let us now turn.

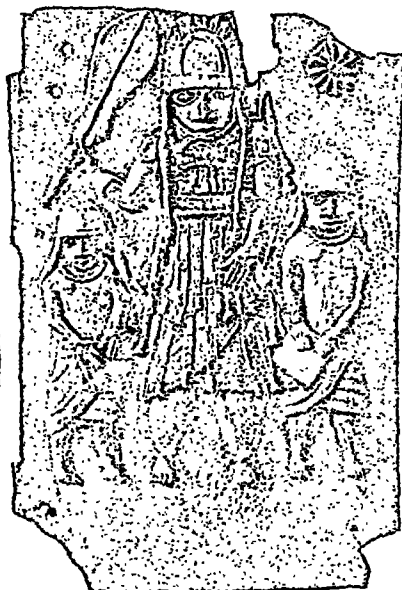
That the liberal arts, the humanities, the pursuits that embody Man's aspiration towards beauty and truth and goodness, in a word, towards the ideal, should be utterly separate and distinct from those prudential activities which aim directly

at self-maintenance is unthinkable, in view of the fact that the best way to succeed in life is to feel it to be worth living. It might seem, indeed, that the savage is too hard put to it in his struggle with his untamed environment to have time or inclination for occupations in which the interest in fact is subordinated to a free indulgence in fancy. Yet those who know him best maintain that, so far from resembling the practical man of the modern world, he is typically a mystic—one who projects his emotions into things so that they stand in his eyes rather for what they symbolise than for what they are.

The sentimental values, so to speak, prevail over the sensible values. An Australian native living in the central deserts seems to us, who judge by his miserable surroundings, the most unfortunate of human beings; yet, when the curtain is lifted to disclose the drama of his inner life, we find that every bare stick and stone is charged with traditional associations that make him appear to himself to participate in mysteries of infinite significance and hence to be most blest.

In every ethnological collection there is a vast array of artifacts vaguely labelled 'ceremonial objects' on the ground that they have no obvious use, and must be, so to speak, stage properties, appropriate to some play of which the text is lost. In short, Man is and always has been body and soul, realist and idealist, at once and together.

Beauty, as we have seen, came with the dawn. Men, however, it would appear, are not all equally endowed with the power of appreciating it; for Neolithic man is to Late Palaeolithic very much as Roman to Greek. Meanwhile, those who have this divine sense seem capable of framing a vision of the abso-



ARTISTIC EMINENCE OF BENIN NEGROES

Although in many respects brutal savages, the natives of Benin, in Southern Nigeria, were masters of the art of bronze casting. The beauty of their productions and their individuality of style are demonstrated by these casts of a girl's head and a chief with two warriors (about seventeenth century A.D.).

From the British and Berlin Museums

lutely beautiful, even if it be limited to some single aspect of it. The cave artists were hunters whose keen eyes perceived the grace of form and movement in the wild creatures about them, and, if they slew, they likewise admired.

True, we have good reason to suspect that the caves were sanctuaries, and that the paintings were part of a ritual designed to secure good hunting. Even so, the artists wrought too faithfully to be merely rated as the makers of spells; and we have the rest of their material culture to bear witness to the passion with which they sought to endow everything that they owned with the charm of perfect form.

But enough has been said already about prehistoric art, whether plastic or graphic, and it only remains to add that among modern savages there is but one close parallel, namely the art of the Bushmen of South Africa, which may quite possibly be the lineal descendant of the other. The caves of South Africa, as compared with those of France, are shallower and more like shelters, so that the Bushman had the advantage of more light for his

work; yet, on the whole, he was not so good a painter as Magdalenian man. But there is one curious development of which traces occur in prehistoric art which he had carried to perfection, namely a pecking method whereby the rock surface is made to represent shading as well as outline.

There is reason to think, though the evidence is poor, that the Bushman was trying to cast a spell on the animals he was depicting. When

Art of the African human beings are shown,
Bushman they seem generally to be engaged in ritual dances and, in particular, to be impersonating the beasts that they hunted—those which they knew well being, by the way, much more accurately rendered than the cattle introduced to their notice by later immigrants, native or European. For the rest, we must be content here to take stock of a few of the more striking examples of plastic skill exhibited by primitive folk.

West African wood-carving, for instance, has lately attracted much attention. More remarkable still is the bronze-work from Benin. Even if we suppose that the 'cire-perdue' method was introduced by the Portuguese—a process whereby the wax model, after being cast in a clay mould with a duct, is melted out and the metal introduced in its place—the cleverness of the native designs is not to be gainsaid. Or, again, the stone statues of Easter Island, some of them 30 feet high, rank among the world's marvels. How and by whom they were fashioned remains something of a mystery, but there are Melanesian analogies which would perhaps account for the odd cast of human countenance favoured—one that seemingly aims at representing Man with some of the attributes of the sacred frigate-bird. Meanwhile, throughout the Pacific, wood is carved with the most exquisite taste, as notably in the way of house decoration among the Maori and other Polynesians.

We must, however, pass by manifestations of the fine art which have already received some notice in other contexts to consider a hitherto unmentioned type, namely the art of music. Durable materials do not enter into the composition of

musical instruments, so that nothing survives of this kind from prehistoric times, with the doubtful exception of certain pierced phalanges of reindeer which, used as whistles, give out much the same sound as can be extracted from a key.

On the other hand, all mankind is given to singing, partly to help on the work in hand in the fashion of a sailors' chantey and partly to relieve the feelings. Whether such feelings be joyful or the reverse, rhythm by regulating the expression of emotion causes self-mastery, and hence brings comfort; wherefore the need for rhythm is primary, whereas melody develops later. A sing-song chant punctuated by drumming with the fists on opossum rugs stretched tightly across the knees forms the musical accompaniment to which an Australian corroboree is danced with immense spirit.

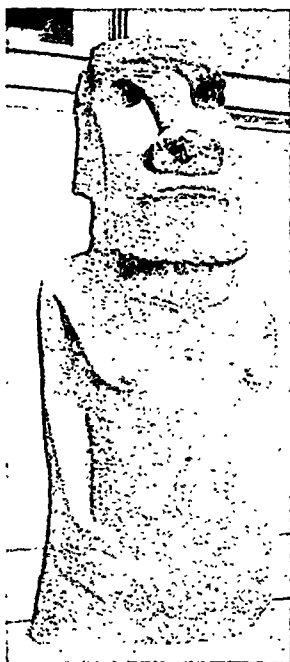
Indeed, drumming on a skin or piece of wood, together with knocking two sticks together in the manner of a castanet, would seem to be as elementary a way of producing rhythmical sounds as any, so that percussion instruments are probably at least as early as wind instruments, while the remaining group of string instruments may well be

later than the other **Drums for Music**
two. Apart from certain **and Signalling** classes of percussion instruments, such as rattles and jingling contrivances that do not lend themselves to much elaboration, there are important varieties such as the drum, or, again, the bell, the interest of which is not confined to music, since they are useful for many other purposes as well, notably for signalling. A signalling drum, by the way, made by hollowing out an immense tree, and looking like a large canoe, is worth a journey to the Naga Hills of Assam to behold. The friction drum, characteristic of Africa, is another curious development.

Melody, as distinguished from rhythm, is most successfully attained by the xylophone, which in the best African specimens is capable of a graded series of the most delicate notes. It is to be noted how a resonator in the shape of a gourd or other hollow body has been added—a clear example of invention. Vibrating



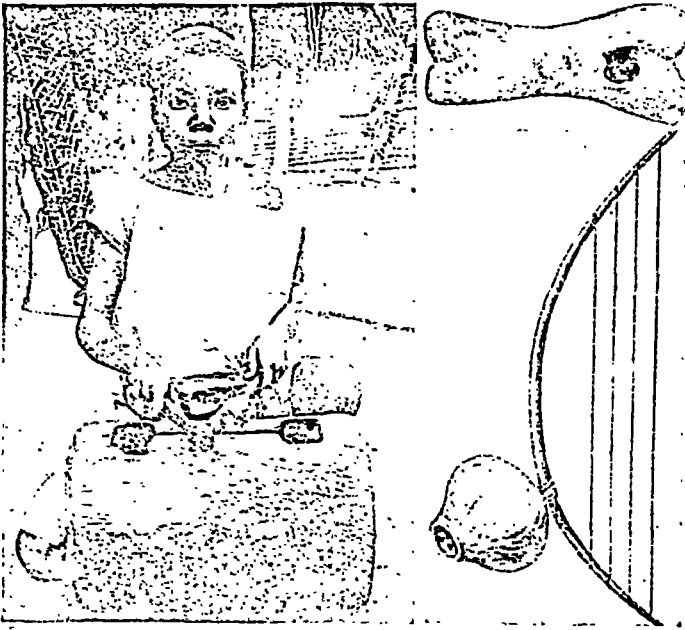
On a small, lonely, treeless island in the South Pacific—Easter Island—there are to be seen hundreds of huge, inhumanly ugly stone images. Though most probably carved by ancestors of the present inhabitants (a mere 250 souls to-day), their meaning is utterly forgotten by them and can only be surmised. Quarried at one spot, they have been transported all over the island; how, we do not know.



Though varying greatly in size, some of the Easter Island statues are truly colossal, as the half-buried monster on the left suggests; a smaller one (centre) was brought to England by a man-of-war and is now in the British Museum. Striking parallels to them (right) are found far away in the Celebes group, though not nearly so large. It is thought that such images may have been connected with the cult of the sacred frigate-bird, and in part were intended to reproduce its appearance.

SOME OF THE STONE IMAGES THAT ARE A MYSTERY OF THE PACIFIC

Easter Island photos, E.N.A. and P. H. Edmunds; Celebes, American Museum of Natural History



CRUDE TYPES OF MUSICAL INSTRUMENTS

Since modern peoples of low culture have drums and simple stringed instruments—here we see an Angola signalling-drum and a Bushman's bow-harp with a calabash for sound-box—it is suggested that prehistoric men also used them. Above is also shown a prehistoric bone implement that may be a whistle.

Bow-harp after Stow; drum photo, Frederick Deale

instruments of the type of the jews' harp can be made of wood, especially of bamboo, and are widely distributed among primitive peoples.

Wind implements might originate in very simple experiments with holed bone or cane or shell. The flute and the trumpet in all their diverse forms eventually emerge. As an ingenious invention for producing a more continuous stream of wind than the cheek can supply, the bag-pipe deserves notice. Its wide distribution, not only covering Europe, but extending to India and again to North Africa, suggests that it is of ancient origin; and, indeed, its appearance in Scotland can hardly be dissociated from the earlier wave of Celtic immigration.

String instruments might be suggested by the twanging of any taut sinew, but undoubtedly the bow has had much to do with this particular development. It may be noted that the Bushmen, who likewise used the drum and a peculiar form of reed pipe, had a four-stringed harp evolved out of the bow as well as a kind of dulcimer based on a combination of twelve bows. Their intense love of

music shows that one kind of artistic excellence does not interfere with another, but, on the contrary, may well join with it in fruitful alliance.

To rest the bow on a hollow vessel, or, better, to fix such a resonator to the instrument, starts the musical bow on its career. The harp is differentiated at the outset simply by using a number of small bows with one large resonator such as a gourd.

Before leaving the subject of the cult of beauty, we must deal with a manifestation of it which may not have the same paramount interest for us as for primitive folk, but must none the less be recognized as one of the chief factors in Man's spiritual progress. Self-adornment, however, is a little hard to disentangle from the clothing of the body for protection's sake. Again, it

is often difficult to say how much is to be ascribed to aesthetic motives and how much to religious, as when amulets, masks, vestments and so on are worn to bring luck or the better to maintain a sacred character or position.

In the latter case, however, the distinction of aspects matters less because in one way or another a spiritual rather than a utilitarian object

is sought. The fact is **Effects of Clothing on Self-respect** that primitive morality has hardly got beyond

the ideal of cutting a good figure in society. It is not enough that a man should mean well; he must appear well in the eyes of his neighbours. A good man is known by his stately pose, his impressive manner, his open pride in himself. Hence to such a type of the noble savage as the North American brave his decorations are precious, forming, as it were, no small part of his moral make-up. His very religion favours the same insistence on outward display, since, so far as his ornaments are luck bringers, they proclaim him in touch with the occult powers, a help to friends and a terror to enemies.

To exclude the utilitarian element the more completely, let us consider a branch of the art of self-adornment into which this element hardly enters; one, too, that is thoroughly primitive, inasmuch as it can flourish only where nakedness prevails. This is the art of denaturalising the body, to use a term wide enough to cover its many varieties.

Into some of these we need not go at length; such as the artificial deformation of the skull, either by flattening or by lateral pressure, causing elongation; or, again, the mutilation of lip, nose, ear, tooth, hand, foot and other organs mostly for the purpose of attaching decorative adjuncts such as labrets, nose-plugs, and so on, but sometimes for religious reasons. But much might be said about the well-nigh universal practice of tattooing, taken together with the cicatrisation or scarring, which mostly serves as an alternative with black-skinned peoples.

The custom goes back to prehistoric times, to judge by the marks on the engraved woman's figure of Solutrean date from Predmost in Moravia; while female figurines of the earliest Egyptian dynasties are similarly adorned. Presumably men painted their bodies before it dawned on them that by rubbing the paint over a previously punctured skin they could render the

Religious side of
Tattooer's art

effect permanent. Possibly, too, since red ochre from prehistoric times onwards has been associated with burials, being no doubt symbolic of the blood needed to revivify the dead, there was all along a religious side to the tattooer's art, which was considered capable of imparting through infusion of colour an enhanced vitality to the living.

A recent work on the history of tattooing, by Hambly, tries to bring out the many-sided efficacy of a mystic kind imputed to the practice by primitive folk. As for beauty, one cannot refuse to see a certain grace in the symmetrical lines and spirals of the Maori 'moko'; while in Japan the art, though confined to the lower classes of society, has developed a technique which surpasses all other known styles in delicacy of form and richness of colour.

Passing from the pursuit of beauty to that of truth, it might seem that science and philosophy are late products of human development. Though this is by no means true, it is not perhaps easy to illustrate the beginnings of the quest for knowledge from the side of the arts. For such information we must look chiefly to the oral traditions of savages—to the myths dealing with the creation of the world, with the origin of man and his institutions, in short with everything about which an intelligent child with his wondering 'why?' wants to know.

Nevertheless, science rests on a twofold foundation-stone which was laid down in primitive times, namely, on the art of recording facts coupled

with the art of measuring them exactly. First, Dawn of a Primitive Science then, as to early attempts to make and keep records. The rude marks and symbols which prehistoric man painted or carved on stone and bone, as well as doubtless on more perishable materials like wood, bark, the hides of animals and his own skin, have little significance for us, and indeed, if they could be interpreted, would possibly be found to refer mostly to passing events of slight importance; yet in them lies the germ of writing and of the all-important substitution of a recorded for an oral tradition of culture.

Such signs are all mnemonic in the sense that they serve as aids to memory; but it is convenient to reserve this term for those which are more or less without suggestive quality, such as knots in a string like the 'quipu' of Peru, or the notches on the wooden tallies once common and still occasionally used in England. Such a distinction, however, must not be applied too rigidly, since the 'wampum,' or shell-beads of North America, though primarily mnemonic, could be made by varying the arrangement or the colour to suggest vaguely both particular objects and even abstract ideas such as peace and war.

On the other hand, the pictograph which, either realistically or conventionally by emphasising outstanding traits, presents a given thing to the eye belongs to the far more interesting group of symbolic signs, from which our alphabet is ultimately

derived. From pictograph to ideograph is but a short step, and indeed any combination of pictographs implies that some sort of general idea is being expressed. The decisive step in advance occurs when a phonetic system, a syllabary or an alphabet, comes into being. Thereupon the syllable or sound is represented by a sign that no doubt always originally stood for a concrete object with a name embodying the syllable or sound in question. Often, as in Egyptian or Chinese, the scribe trusted his phonetic symbol so little that he added a determinative picture of the thing as it looked to help out the word as it sounded (see further under Chap. 35).

To turn to the art of measuring, a great deal might be said about its development by the aid of a mechanism which man always has had

Measuring by at his disposal, namely,
fingers and toes his body. Thus, for purposes of numeration, he had

simply to count by his fingers in tens, or by fingers and toes in scores, and it is a common mistake to suppose that, because separate words are lacking in a primitive language for numbers higher than, say, three, therefore the power of reckoning in larger sums was absent.

Ciphering by means of objects such as seeds or pebbles—the very word calculate coming from the Latin ‘calculus,’ a pebble—is no hard matter to invent; though arranging them on a counting-board, especially if this be furnished with a blank or ‘zero’ column, involves considerable ingenuity. Again, spatially, the finger, hand, foot, the natural yard from the middle of the chest to the middle of the outstretched hand, and the natural fathom from hand to hand across the chest, are measures easy to apply.

Time-reckoning, on the other hand, is perhaps not very important to the early hunter—far less at any rate than it is to the agriculturist. For the hunter it is time to eat when you have killed, and time to sleep when you have eaten. Seasons no doubt affect him in a general way, and he realizes, especially in northern latitudes, that the year goes round; while moons, since moonlit nights are an advantage, are more closely watched, and form the basis of the hunter’s calendar.

As for the time of day, every hunter can fix it well enough for his purposes by reference to the habits of animals and plants, as we ourselves also judge by cock-crow or by flowers that open and shut. A surer method, however, is to watch the waxing and waning of the shadows; and it is but a step from the natural sun-dial to the post or pillar set up in an open place with marks round it to show where the shadow will fall at the different hours. Another form of clock is provided by anything that can be reckoned on to complete a process in a given time, as a candle or lamp that burns itself out, or a vessel that fills or empties itself with water or sand.

When an agricultural year coinciding with the return of the seasons has to be worked out, both sun and stars must be observed carefully, and astronomical lore becomes an important part of religion. Thus there can be little doubt that the cultivators of the Bronze Age paid great attention to orientation, and by marking the direction with stones could predict where sun or star would appear at stated times; being probably under the impression that by means of their rites they were not so much recording as actively regulating the movement of the universe.

Moreover, not only the physical sciences, but likewise that other important group, the biological, can be traced back to very primitive beginnings, as is best seen by studying **Efficacy of Primitive Medicine** the origins of the allied arts of medicine and surgery. Something has already been said about poisons. It remains to add that simples of beneficent virtue are no less in request, and that of a list of these collected from Australian natives a very large number were found actually to have the remedial properties claimed.

As for surgery, the savage is a good patient, and it is wonderful what cures such rough instruments can effect; as is illustrated by the successful cases of trepanning which are often reported from the primitive world, from New Britain, for instance, where crowns cracked by sling-stones are constantly mended in this way. Nay, every hunter possesses what Tylor calls a good ‘butcher’s anatomy,’ and can operate on the body of his wounded mate,

with due regard for the positions and functions of the various parts.

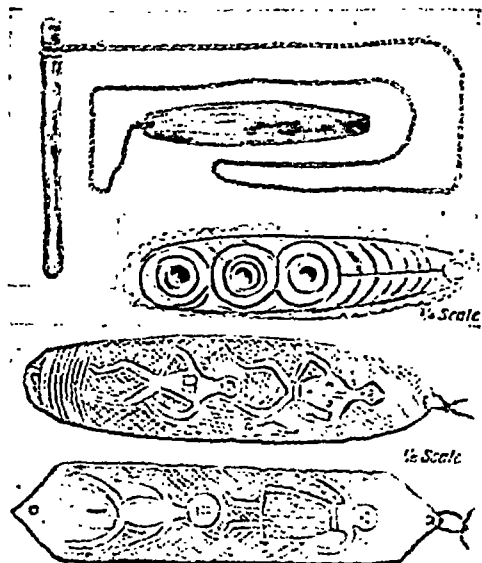
It remains to say something, from the standpoint of the arts, about the furtherance of the higher life of primitive man as effected through his religion. On a superficial view his rites and the accompanying beliefs might seem to us childish, when they are not positively degrading. But, since all religious feeling expresses itself through a certain symbolism, we must be sure before passing harsh judgements on other men's forms of worship that we know what they mean for them. A stick or a stone, a piece of bread or a smear of blood—something in itself trifling or even vile—may stand for ineffable mysteries.

The case of the bull-roarer is instructive. Here is a mere slat of wood which when whirled round at the end of a string produces a queer booming sound. In itself it seems worthy only to be a toy, and such it is to-day in most parts of England, though its Scots name of 'thunderspell' suggests that it has not yet quite parted with its mystic associations.

It is usually held to go back to Palaeolithic times, since certain ivory pendants of Magdalenian age look very like miniature bull-roarers that have become amulets. Be this as it may, the distribution of the instrument is so world-wide that with some reason it has been hailed as the most far-travelled, and therefore most ancient, religious symbol in the world.

Perhaps a utilitarian value helped to gain it mystic significance; for animals are surprisingly scared by the sound, so that the Bushman hunter uses it to round up his game, the Malay planter to drive away elephants from his crops, and the European peasant to call his cattle home, or rather to send them flying towards the byre.

Meanwhile, the sound of the bull-roarer might well suggest the noises of wind and rushing rain and thunder, very welcome noises in a dry land. So it is no wonder if the Australian hears in it the voice of a great being who causes all things to grow. Such a high god, who is likewise in all other things the friend of



UNIVERSAL MAGIC SYMBOL

Wooden slats that make a 'magic' noise when whirled round the head, bull-roarers occur from East Africa (top), where they are also used for rounding up game, to New Guinea (bottom) and Australia. Certain small Magdalenian objects in bone (centre) may therefore have been miniatures serving as charms.

After Breuil and Ratzel

man and has given him all his institutions, presides throughout south-eastern Australia over the initiation ceremonies at which the boys are turned into men—very appropriately, since he is the god who makes all things to grow. Thus round a thing of naught, a small boy's buzzer as we rank it in England now, has developed a religion of remarkable intensity and elevation among a people whose material culture is that of the Stone Age.

It would be out of the question here to attempt the briefest survey of primitive religious symbols in all their variety. The savage is so much of a mystic that religion is bound up with almost every act of his life. In fact, all that has been said hitherto about his arts should be taken as subject to the qualification that, whatever obviously practical ends they may serve, they have also uses, largely hidden from us, which relate wholly to the world of the spiritual and occult.

A spear, for instance, may be fitted with a piece of human bone which, apart from any mechanical value that it may possess, ensures the assistance of a friendly ghost

who can make the weapon fly true. Indeed, one might overhaul a savage warrior from top to toe without finding a single article of his equipment that was not intended as much to frighten and bedevil his enemy as to wound him; or, conversely, as much to sustain the soul of the wearer as to protect his body.

Or let us suppose a chief to be building himself a fine house of carved wood. He is not thinking out his plans in terms of mere accommodation or display. On the contrary, from the moment of driving in the first post—which he will be careful to establish by a foundation-sacrifice involving the pouring of blood into the hole, perhaps of human blood—he is concerned largely with the construction of devices calculated to bring a blessing or, what comes to the same thing, to avert the evil eye. Many a hideous image which is put down to the discredit of the idolater is merely a sort of lightning-conductor—something that by its very grotesqueness compels the ill-natured passer-by to bestow his first glance upon it and so, as it were, to let off his piece at a dummy.

Apart from the endless cases of a magico-religious purpose associated and almost indistinguishably mixed with practical and worldly ends, there is a whole vast group of what are usually classed as 'ceremonial' objects. It is

just as well to employ some such neutral term, since to decide what is religious and what merely magical in the material accompaniments of a savage rite is hard, and indeed depends entirely on one's private definition of these debatable terms. Certain it is that, by simple inspection of the thing in question, and without full knowledge of the motive whether spiritually uplifting or degrading that underlies its use, one could not tell under which category to place it.

For example, the museums of Australia abound with strange devices—fantastically shaped arrangements of sticks and grass and feathers—which are associated with various ceremonies certainly religious in the sense that the natives declare that their performance not only brings them food and other material advantages but likewise makes the participators feel

'strong' and 'glad' and 'good.' In the case of central Australia we happen to have very sound and detailed evidence about the meaning of such rites, which fall into two main divisions: those intended to cause nature to be fruitful and those commemorative of ancestral beings of the Golden Age who are conceived, almost after Darwin's manner, as half-human, half-animal, though in any case infinitely glorious, and such as it is soul-enlarging to imitate and portray in solemn dance.

Or, again, masks would deserve most careful treatment, not only because of their prehistoric origin and world-wide distribution, but perhaps especially in view of the fact that the masked human figure almost certainly develops into the cult image. Thus, apart from the tendency, already noticed, of the artist being apt to run two designs into one, there is historical reason for that confusion of human and animal forms which runs through so much of the religious art of the savage. The famous sorcerer, for instance, of the cave of Les Trois Frères has his upper parts concealed by a huge and impressive mask representing the reindeer; but the legs nevertheless bewray the man.

As fine art such hybridisations of forms which nature keeps apart are doubtless unpleasing. As religion, however, they are perfectly suitable for those who extract from a complexity of symbols, as we do from a group of diverse letters, an idea of many, yet harmonious, aspects.

So much, then, by way of final reminder that, in order to appreciate savage arts and crafts, it is not enough to stare at a row of museum cases; some previous attempt must have been made to understand primitive life as a whole. And this, after all, is not so hard as it may seem. For these, too, are human beings, nay, are of the very fashion of our own ancestors. In short, if in their case different conditions of life have provoked different reactions, nevertheless Man at heart is ever much the same. Hence, for the sympathetic and fair-minded, the way to a just appreciation of the long and successful effort of our race to achieve self-culture and self-realization lies always open.

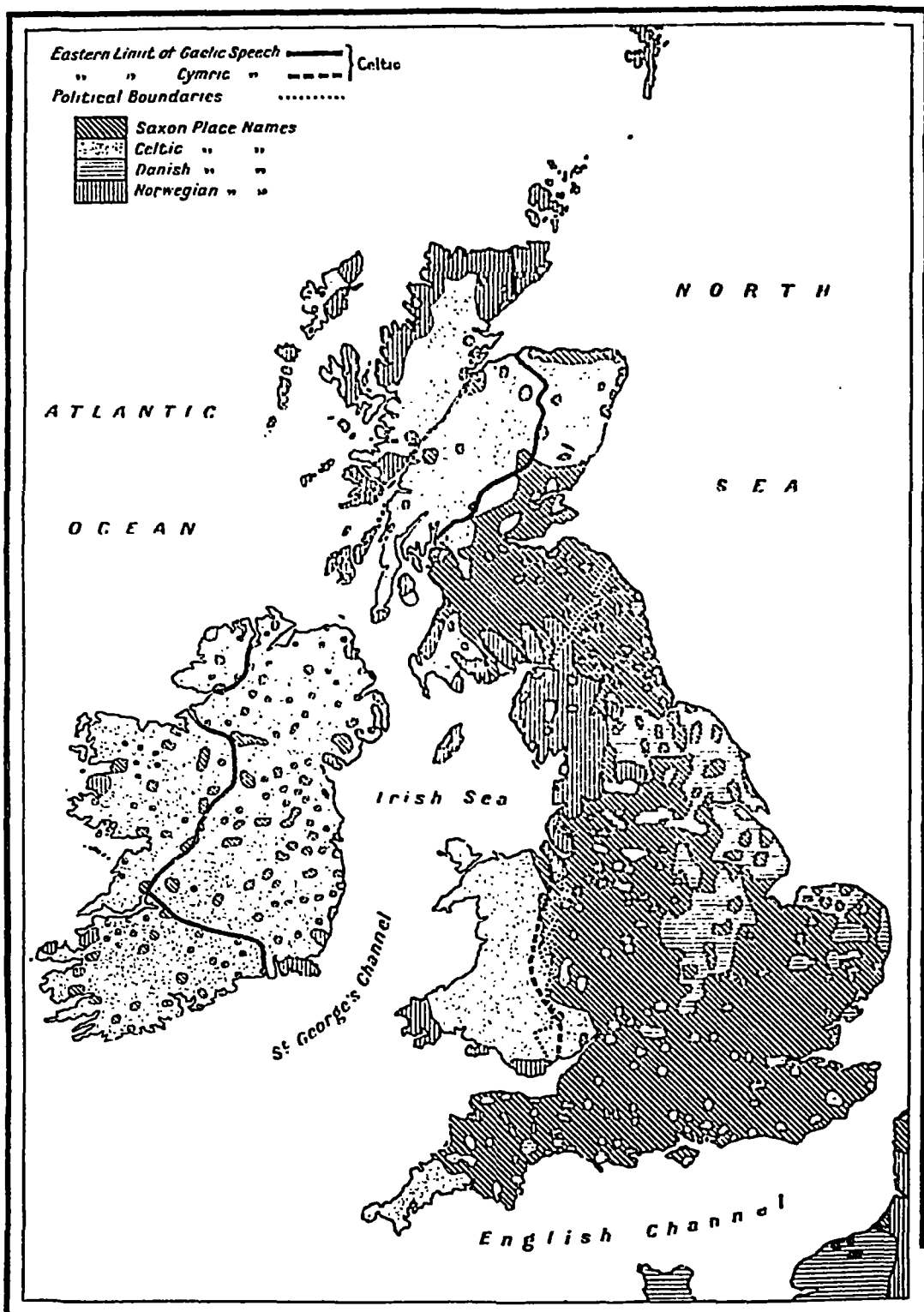
Origin of the
Cult Image

Some Aspects of History

PRELIMINARY STUDIES IN THE SOCIAL EVOLUTION OF MANKIND

7. RACIAL SPIRIT AS A FORMATIVE FORCE IN HISTORY
An Investigation of the Causes underlying Race
Divisions and their Effect on Human Relations
Prof. Sir Arthur Keith, M.D., D.Sc., F.R.S.
 8. LANGUAGE: ITS ORIGINS AND HISTORICAL IMPORTANCE
Man's Babel of Tongues and what their Study can
tell us of his mental Development and past History
Prof. John Fraser, LL.D.
 9. CLIMATE AND GEOGRAPHY: THEIR INFLUENCE ON HISTORY
How the Current of Man's Actions in his Struggle
for Existence has been directed by Environment
Prof. J. L. Myres, D.Sc., F.B.A.
 10. THE IDEA OF THE SUPERNATURAL IN HUMAN DEVELOPMENT
An Evaluation of the immense Part played in History
by Man's irrational Beliefs about the Unseen World
Prof. G. Elliot Smith, Litt.D., D.Sc., F.R.S.
 11. WOMAN: HER STATUS AND ITS INFLUENCE ON HISTORY
Wherein it is argued that one Half of the Human
Race has been all but neglected in Historical Research
Mrs. Ray Strachey
 12. HISTORY'S ECONOMIC BACKGROUND: A NEW FIELD OF STUDY
Showing the Influence exerted by essentially Material
Forces on the Trend of Politics Conduct and Morals
Prof. Harold J. Laski
 13. THE CONCEPTION OF EMPIRE: HOW IT HAS MOULDED HISTORY
The gradual Expansion of the Imperial Idea traced
through its various Manifestations in Human Record
Sir John Marriott
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BEFORE history can be properly understood, it is necessary for the student to acquire at least a sympathetic insight into certain fundamental factors of human conduct, universal in their working and not to be referred to any one period of historical time rather than another. Seven of the more important are accordingly outlined in the study-chapters of this division, immediately preceding our First Era. It may be asked why they are not prefixed to our preceding division, The Prehistoric Era: to which the answer is that they deal with forces that are mental rather than material, and so, though no doubt active throughout the whole of Man's career, only admit of being illustrated by reference to record history.



TANGLE OF TONGUES, RACES AND PLACE-NAMES IN THE BRITISH ISLES

The words Celt and Saxon (see page 305) stand for ideas rather than facts. If we regard them as *tongues*, this map shows that Celtic only maintains itself in remote parts of the British Isles; if as *races*, anthropologists tell us that they are indistinguishable. The political boundaries, which bear no relation to areas whose place names should mark them as Saxon, etc., correspond most closely to physical differences; thus we see that national divisions can inaugurate races.

RACIAL SPIRIT AS A FORMATIVE FORCE IN HISTORY

An Investigation of the Causes underlying Race Divisions and their Effect on Human Relations

By Sir ARTHUR KEITH

Hunterian Professor of Anatomy, Royal College of Surgeons; Author of *Ancient Types of Man, Nationality and Race, etc.*

EVEN in that period of antiquity when the Book of Genesis was written thoughtful people were asking the question: Why are there different kinds or races of mankind? For the thinkers of that early day observed, no doubt, that friction and trouble always arose when diverse races of mankind came in contact with each other; it did not need a philosopher to tell them that the world would have been an easier and happier place to live in had all mankind been of the same breed.

There was another problem, too, which puzzled the ancient Hebrews: Why is it, they demanded, that these diverse peoples speak in tongues so different that the one cannot understand the other? Manifestly the world would have been a less distracting home for the ancient Israelites if everyone then alive had used the same speech; since a host of difficulties, some of them laughable, but many of them grave and threatening, arise when men who speak different languages are thrown together.

The answers which the old philosophers of the East returned to these two questions we all know. The sons of Noah—Shem, Ham and Japheth—and their respective wives gave origin to the various races of mankind. Incidentally, the author of Genesis explains why the Hamitic or dark races occupied a servile place amongst the others: it was because their ancestor, Ham, had behaved shamefully to his father, Noah. With the naïve explanation of how the confusion of tongues arose we have all been familiar from childhood. The city and tower of Babel were being built when the Lord

came down and said: 'Behold, the people is one, and they all have one language; and this they begin to do: and now nothing will be restrained from them, which they have imagined to do. Go to, let us go down, and there confound their language, that they may not understand one another's speech.'

We who are wise in the wisdom of these modern days may smile at the ingenuousness of these answers, and the child-like faith which made them acceptable, but we must give credit to these ancient Hebrew savants for recognizing that the problems of the origin of the human races and of diverse forms of speech were matters which do require to be explained. Furthermore, we must remember that the Mosaic explanations have been accepted as satisfying by many of the most learned men in Christendom, almost down to the twentieth century.

Just a century ago Sir Charles Lyell, the great geologist, had come to the conclusion that to explain the stratification of the Earth's surface it was unnecessary to claim Geology sheds light on Life that it had been wrought by supernatural forces.

He realized that the carrying power of running streams, the eroding action of tides, the effects produced by frost and ice, the changes caused by volcanic action and the ever-recurring movements of elevation and sinking in the Earth's crust were sufficient to account for all the facts that came under the consideration of geologists. In brief Sir Charles Lyell was convinced that creation, so far as it concerned the texture and conformation of our Earth, was not a thing which happened

far away and long ago, but was happening here, now and everywhere about us, if we had but the eyes to see; that is to say, that the Earth was still in process of creation.

Hence, when he published his *Principles of Geology*, in 1830, he stated that

the forces now operating upon and beneath the earth's surface may be the same both in kind and degree with those which at remote epochs have worked out geological revolutions; or, in other words, that we may dispense with sudden, violent and general catastrophes, and regard the ancient and present fluctuations of the organic and inorganic world as belonging to one continuous series of events governed by uniform laws, similar to those now in operation.

In this long sentence Sir Charles informed his readers that he no longer believed in the biblical flood.

When Charles Darwin set out as naturalist in the *Beagle* on Christmas Day, 1831, he placed Lyell's *Principles of Geology* in his kit-bag; it became his Bible of science. After studying the behaviour and nature of living things for the best part of a lifetime, he was forced to the conclusion that Lyell's law was applicable to the whole realm of animate nature. Darwin revealed to the men of the nineteenth century that the machinery of creation is still at work in the world of living things, only he used a new term for creation—namely, evolution.

Darwin's message to his generation was this: If you will but study the manner in which nature and Man are producing new forms of living things in the world of to-day, you will obtain a reasonable explanation of how the Earth, during its long past history, has come by its rich diversity of plants, of beasts, of humanity and of human speech. In brief, Charles Darwin sought to convince mankind that the Garden of Eden still endures and that we who live in it can still study the manner of creation and return reasonable answers

to the ancient questions: How came the diverse races of men into existence? How has the multiplication of tongues arisen?

Of the 1,600 millions of men, women and children that are now alive, not any two are exactly alike; every year some thirty millions of babies are born into the world and every one can be distinguished from all the others. Nature cannot reproduce exact replicas of any living form; every birth is an experiment in creation. Charles Darwin made this fundamental fact the chief cog in his wheel of evolution. The second cog in this wheel was competition; Darwin realized more clearly than anyone had done before him that the world of living things was run upon a rigidly competitive basis, and that all but the fittest were eliminated.

The mode in which competition works in the evolution of humanity is peculiar and often misunderstood. Evolutionary

struggle is always going on between the people of one country and the people of another, but within these peoples we find that the 'struggle' is masked and beautified by the spirit of co-operation and of comradeship. We shall have to return to this aspect of human competition, its place in nature's evolutionary machinery and its bearing on the manifestation of racial spirit; in the meantime it is sufficient to draw attention to the fact that the stronger the spirit of mutual service within a tribe, a people or a race, the more able does that tribe, people or race become to

'take a place in the sun.'

Darwin saw that evolution, or creation, was still at work in the world of humanity, because every child born into the world brought with it a novel combination of bodily characters and mental qualities; and that in the competition of life certain of these infinite combinations were favoured and their possessor prospered,



DARWIN'S MENTOR

Famous as the father of geology, Sir Charles Lyell (1797-1875) had also a profound influence on the contemporary world of thought. Darwin was much indebted to him.

while other combinations were repressed and ultimately discarded. He saw that the process of 'selection' was ever at work.

There is a third cog in Darwin's wheel of evolution which is of particular importance to everyone who would seek to explain the formative influence of racial spirit in the history of mankind. Darwin noted the manner in which gardeners, bird-fanciers and farmers proceeded to raise new breeds or varieties. They separated or enclosed such plants or animals as possessed the qualities they desired to perpetuate from all other plants or animals, so that the new forms might reproduce their kind without fear of contamination from without. From such observations Darwin inferred that isolation must be part of nature's creational machinery. He observed that islands which were far removed from continents, such as the Galapagos in the Pacific Ocean, were remarkably rich in new forms of life. Isolation had favoured the production of new species in these islands.

At first sight it would seem that isolation has played no part in the machinery which has split mankind into so many varieties, for on the Earth to-day the barriers that divide any nation, tribe or class from any other

Racial Spirit : its part in Evolution are surmountable, and this has been so for a long geological epoch.

Nevertheless we shall find that isolation is, and has been, one of the most important factors in the production of human races. It has been produced, however, not by geographical circumstances but by certain modes of working, which have become inborn and ingrained within the human mind. We shall find that those qualities of the human mind which are manifested in every-day life as 'racial spirit' are in reality an ancient and essential part of nature's creational machinery; they isolate and divide mankind into tribes, nations, castes and classes.

It may help my readers to understand the arguments I am to place before them if I explain how I came to look at 'Race Spirit' not with the eye of a politician, but with that of a student of evolutionary processes. Soon after the beginning of

the present century medical men discovered that within the human body, even from the time when it is forming in the womb and all through the years of childhood and adolescence, there is at work a system which regulates growth, determines the shape of the body and imprints upon it the characters of race.

This system that governs and regulates growth is carried out by substances which circulate in the blood in exceedingly minute quantities, and are known as hormones.

Physiology in its application to Race Such substances are formed in certain of the smaller glands of the body which have come to be named the 'glands of internal secretion,' because they throw that which is formed within them not into ducts but directly into the circulating blood. We know already that there are many kinds of hormones, and that each produces a definite effect both on the growth of the body and on the mode in which the brain performs its work. Although our knowledge of the hormone system is still very incomplete, yet by 1910 it had become evident to me that a very essential part of the physiological machinery concerned in the production of human races had at last been discovered.

It was also evident to me then that the hormone system could not be effective in producing race differentiation if men and women of all parts of the world wandered hither and thither, hailing each other as fellows, living together, and, by the union of the sexes, intermingling their blood. For if men and women did behave in this way, then their blood would remain uniform, the hormone system of everybody would work in a similar way, and mankind would be of one colour and of one race throughout the world. Considering how greatly living races differ from one another and yet all have the marks of a common origin, it became manifest that there must be a natural machinery ever at work seeking to separate mankind into permanent groups or communities, and maintaining their isolation through the ages so as to procure a final result—a new race. The more closely one studies the workings of nature the more clearly one realizes that one of their main

results is the production of new forms of living things. To permit the hormone or creative machinery to accomplish its purpose, evolutionary cradles must be circumscribed—for every human community is a possible cradle or nursery if isolation be consistently maintained.

In seeking to determine the machinery which nature has used, and still uses, to isolate mankind so as to form evolutionary cradles one thinks first of great physical

barriers—of wide oceans, high ranges of mountains, and pathless tracts of desert. Far from the

sea serving as a barrier it is, and has been for many thousands of years, a highway between distant countries; the loftiest mountain ranges became passable for Man as soon as he could walk, and we have definite evidence that before the end of the Pliocene period—certainly a quarter of a million of years ago—he had already come by his characteristic lower limbs and gait (see Chap. 4).

Physical, or geographical, barriers have played quite a minor part in the isolation of human races and in the formation of evolutionary cradles. We have to seek nature's barriers not outside Man's body, but within it. That barrier is erected by certain mental intuitions, predispositions to act in definite ways, to follow certain lines of behaviour, which have been called instinct, and all of which make up those manifestations of the human mind known as Racial Spirit.

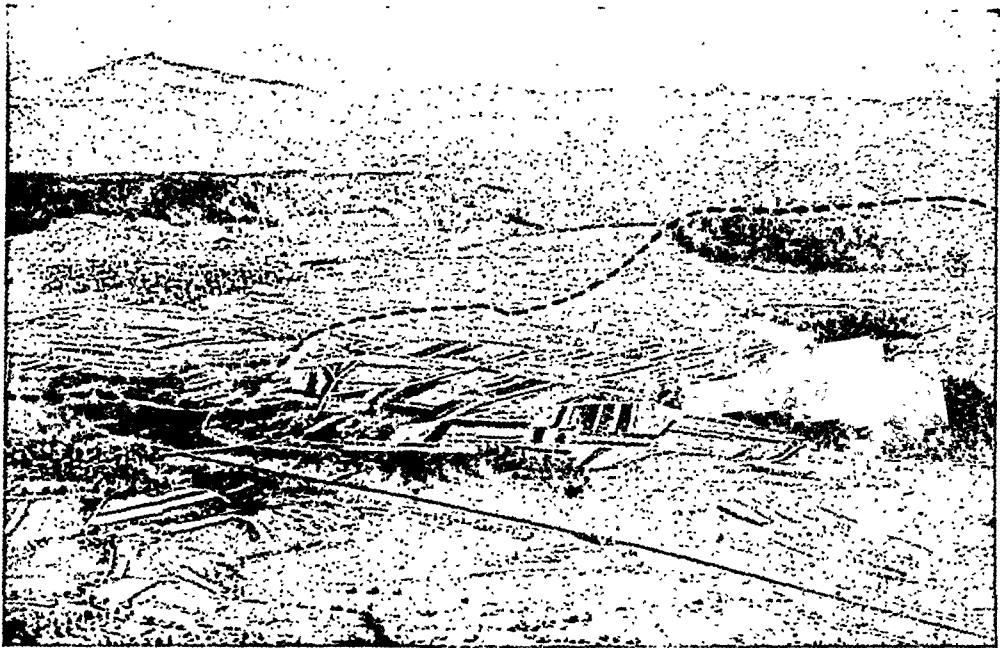
As every schoolboy knows, the whole area of Europe is divided into sharply defined national compartments. Each compartment is circumscribed by its national frontier, the countries of Europe requiring 2,600 miles of frontier line to mark their boundaries. By use of colour and heavy borders map makers have so impressed these frontier lines on our imagination that when we go abroad and travel from one country to another we expect to see some visible dividing line on the landscape.

It is true that we do occasionally find physical barriers—a range of mountains, a strait, an inlet of the sea or a wide river—but more often the landscape as seen through the window of a railway carriage

remains the same; there are the same farmhouses and fields, the same village and towns. Were it not that our passports are examined and our luggage searched by men who speak a different tongue and wear a more surprising uniform than those who searched and examined us on the previous day, we could not tell that we had crossed one of the many crucial lines of Europe. Even if we proceed, not by train but on foot, to cross such a frontier we find no real line of separation.

The men and women whom we see working in the fields, or those whom we meet on the roads and streets, on both sides of the frontier seem the same; if we were to dress them alike the most expert anthropologist could not tell from which side of the frontier they had come. And yet the one set of men will claim to be of one nationality and the other set of another. If their claims to nationality are examined they will be found to depend on the side of the frontier line on which they were born and on what their speech is, for it is generally recognized that if a national frontier is to be an abiding one it must correspond to a lingual frontier. Peoples divided by a difference in speech are never unanimous in their outlook on the affairs of life (compare page 330).

The frontier line which seems so insignificant to the passing traveller is charged with deep meaning to all classes of the population living within its circuit. They work hard and tax themselves heavily to maintain great armed forces to guard their frontier line and keep it intact. They will die rather than see any National Frontiers flag but their own flying at the frontier posts. If a neighbouring power should insult this flag, or invade the country whose symbol it is, the feelings of the whole nation are aroused and the inflamed national spirit is reflected in the heavily leaded headlines of the press. Class prejudice disappears; beggar and king shake hands and ancient enmities between neighbours are composed in face of the threat of foreign aggression. Patriotism is the force which builds and maintains national frontiers, and patriotism, we shall find, gives birth in the



ARTIFICIAL BARRIER SUCH AS MEN CREATE FOR THEMSELVES

Plants and beasts are divided into varieties by barriers physical or climatic. Man the adaptive has become independent of such restraints on intercourse, but the instinct to collect in groups still operates, and he accordingly sets up for himself artificial barriers—how artificial is suggested by this air photograph of the boundary (shown dotted) between Germany and Switzerland at Hohentwiel.

Specially taken for this work by Ad Astra

course of time to that larger manifestation of human feelings—Race Spirit.

That we may consider its workings, the human brain may be divided into many storeys. There are the lower storeys, which we have in common with creatures of very ancient days, and in which the lowlier functions of mental life are carried on. There are also the higher storeys, which have developed more recently; there the brain gathers experience, forms judgements and determines reasoned modes of conduct. A struggle is for ever going on between these upper and lower storeys of the brain. By education and self-discipline men bring desires situated in the lower levels of their brains under the subjection of those faculties which are resident in the upper levels.

When the stress of events is such, however, that we must act in the mass—when the heart leads rather than the head—then the more primitive forces in the lower levels rise up and take command. This is what happens when a nation is threatened; but even in times of peace, when passions have cooled, we are con-

stantly and jealously on guard to ensure that our national integrity be maintained. To those who are participators in the life of Europe, this deeply-rooted desire for national independence—this resurgent spirit of self-determinism—seems natural and rational.

To onlookers from without, on the contrary, this everlasting struggle to maintain independence and preserve national frontiers seems a form of madness. If Europeans were really rational beings—so critics tell them—they should cultivate the spirit of fellowship and suppress that of independence; they should break down national frontiers by intermarriage, mutual trade and social service; they should each and all of them extend their spirit of nationality until it embraced the whole of the continent in which they live. They would thus become free from overwhelming burdens of armed force and relieved from an ever-present anxiety. A policy of this kind has been preached from the pulpits of Europe for more than a thousand years without effect; national frontiers are as jealously guarded as ever.

Clearly there is something deeply rooted in the brain of Man which drives him along a course which is so very different from that which his higher reason would indicate to him. We cannot understand the true significance of the apparently irrational behaviour of nations, their patriotism, their pugnacity and their spirit

of independence, until we come to study such qualities from an evolutionary point of view. When we realize that the whole kingdom of life is designed to secure the production of new forms, and that to accomplish this aim isolation—what I have termed evolutionary cradles—is a necessity, then we begin to perceive that national or racial spirit has a very great significance. It is essential for the production of new races of humanity.

My readers will have observed that I have attached the same meaning to 'national spirit' as to 'racial spirit,' as if they were identical terms. This may appear, at first sight, to be an unjustifiable presumption, for it is recognized by all that the populations of the great states of Europe have been compounded by the intermingling of racial stocks.

In the British Isles we have four nationalities, each of them compounded out of at least two races—Celt and Saxon. Or, if we use a more recent classification, we have to distinguish in each of our four nationalities the progeny of three racial stocks—the fair Nordic, the dark Mediterranean and the round headed Alpine breed. In France, Germany and Russia we find blends of the same racial elements but in differing proportions, yet in all these countries people are actuated not by racial but by national spirit. Before this apparent discrepancy can be understood we must first come by a clear conception of what an anthropologist, and then a politician, have in mind when they speak of a human race.

If the theory of evolution is true, and has always been at work in the world of humanity, then we ought to find human races in all stages of differentiation. This is exactly what we do find. As we pass along the thronged streets of London or of New York we recognize the negro at

once—no matter what tongue he speaks, what clothes he wears or how cosmopolitan his manners may be. A Chinaman or Japanese may behave exactly as Englishmen do, yet a glance of the eye tells us that they do not belong to our great racial stock—the Caucasian or white race. Did Australian aborigines frequent our streets we should soon learn to pick them out too. If we took a hundred individuals of each of these four races—Negro, Mongol, Caucasian and Australoid—and mixed them in a crowd, we should have no difficulty in again separating our original hundreds; we can make correct identifications in 100 per cent. of instances. Negro, Mongol, Australoid and Caucasian are called 100 per cent. races; or—to use a convenient term coined by Morley Roberts—they are pandiactic races. Even when members of such races intermarry the blended origin of their progeny is apparent to all.

Then there are other races which, in a large international gathering, we succeed in identifying correctly in over 50 per cent. of instances, but fall short of 100 per cent. As an example we may cite the brown race—best represented by the natives of India, particularly of southern India. We shall probably succeed, if put to the test, in isolating 80 per cent. of this particular sample of the brown race, but there will remain some 20 per cent.

about which we are in doubt. They may as well be natives of Persia, Egypt, Asia Minor, or even Greece or Southern Italy, as of India. If Chinese and Japanese were to pass before us, dressed in European clothes, and were to speak the same tongue, we should probably succeed in making correct identifications in a like number of instances. So it would be were we to take groups of natives from southern China, Burma, Siam, the Philippine Islands and Peru. After they had been mixed together in a crowd we should probably succeed in assigning about 60 per cent. of each group to its proper country; at the same time we should recognize that all of them were variants of the Mongolian stock or race.

Russian anthropologists maintain that they can distinguish Jews from other

Europeans in about 70 per cent. of instances merely from an examination of outward physical appearance. This is in agreement with the experience of British anthropologists. Thus we apply the term 'race' to peoples which fall short of complete differentiation; they pass above the 50 per cent. standard, but fall short of the 100 per cent. It is convenient to have a name for such races, and that proposed by Morley Roberts, mesodiacritic, is very convenient. It is important to note that when a marriage is contracted between members of two mesodiacritic races which originally belonged to the same stock, such as between Japanese and Chinese or between Jew and Gentile, the progeny of such marriages can usually pass as a member of the race of either parent.

When we come to consider the population of Europe we may take the inhabitants of Norway, Sweden, North Germany and Finland as representing the Nordic race, and those of Italy, southern France and Spain as representing the Mediterranean race. We shall find, if we mix representatives of these countries in a crowd, that after we have picked out all the Nordics and Mediterraneans whom we can identify with certainty, there remain more than 50 per cent. that might be assigned to either North or South, so equivocal are their characteristics.

If we compare the inhabitants of the Balkans with the people of England or of Ireland, depending on external appearances alone for a diagnosis of race, we shall come by a similar result. Racial discrimination in Europe, in its most pronounced state, falls short of the 50 per cent. or mesodiacritic standard. Nature's attempt to produce separate races in Europe, therefore, has only reached a standard which may be named microdiacritic. In the British Isles race divergence has reached only the lowest rung of the ladder by which races ascend to complete differentiation.

The professional British anthropologist has given up the attempt to distinguish Celt from Saxon. When he walks along the streets of Edinburgh he meets pure Celts from the Highlands and pure Saxons

from the Lowlands, but he cannot tell the one from the other in more than 5 per cent. of instances, unless he has some guidance from speech or from clothing. He has abandoned the old racial division because he finds there is a greater physical difference between the Celts of Wales and those of Ireland than there is between the Irish Celt and the English Saxon. When we try to set on a map of the British Isles to-day the lines which most clearly show the different physical types of British manhood, we find that these do not divide the land into those areas occupied respectively by Celts and Saxons, but follow the national boundaries.

If an expert anthropologist were called upon to separate natives of England, Wales, Scotland and Ireland in a vast crowd of Europeans he might succeed in allocating 10 per cent. of the Saxon from Celt? individuals to their respective countries; in the case of Wales he might be even more successful. Each of the four countries of the British Isles may be said to contain an incipient or microdiacritic race; each country, if the national spirit were uncurbed, might climb up the ladder which leads to pandiacritism—complete differentiation. A national spirit is an incipient stage of a racial spirit. But if British anthropologists have abandoned the terms Saxon and Celt because they can find no reliable physical marks by which the one can be distinguished from the other, our statesmen and political writers have shown a truer judgement, and still speak of Saxon and of Celt. They realize that race is not a matter of the body, but of the spirit.

The physical marks upon which the anthropologist relies in distinguishing one branch of humanity from another are but the fruit produced by the workings of a race spirit within a people over a long interval of time. It does not require physical differentiation to make neighbouring peoples racial antagonists. The Saxons who began to settle on the eastern lands of England and Scotland in the fifth century of our era were almost of the same racial stock as the Celts whose lands they seized and occupied; the tongues they used were derived from a common Aryan source.

There had been a time when both peoples occupied the same homeland and shared the same racial spirit. Long before the days when Rome dominated the greater part of Europe the Celtic inhabitants of Britain had become split up into a congeries of territorial communities speaking different Celtic tongues and dialects; the same had happened to their Saxon cousins who

remained on the Continent. In the course of time these descendants of a common stock,

having, since their separation, evolved new forms of speech, new manners of living, new beliefs and new traditions, met in the British Isles as racial antagonists. In the course of centuries the Saxon spirit and language prevailed, and out of the conflux emerged four nationalities, each apparently moved and swayed by its own national spirit and each compounded of Saxon and Celt in different proportions.

But to everyone who has watched the trend of historical events in recent centuries it is patent that the old spirit of antagonism between Saxon and Celt is not dead. The people of the greater part of Ireland desire to separate themselves from the rest of the British people by having their own laws, their own flag, their own speech and their own wall of tariffs. Yet to impartial onlookers it has seemed that the people of the Irish Free State have every material inducement to pursue an opposite policy—one of fellowship, not of isolation. By sinking her spirit of nationality in that of Britain the Irish Free State could have attained that which seems most precious to all peoples—a sense of security; and could have continued to share in the heritage of the British Empire. It is clear, then, that race spirit or national spirit is not an affair of physical anthropology nor of economics, but of certain intuitions and predispositions which permeate to the roots of human nature. To obtain a clue to the manifestations of man's racial spirit we have to dive deeply into long-past phases of human evolution.

No matter which country in Europe we may select, we find that when its history is traced backwards we soon leave behind us great cities and widespread networks

of roads and railways, and enter a time when village communities were linked by bridle-paths. Still farther back, entering into the Neolithic Period, which came to an end in most parts of Europe some 4,000 years ago, we no longer find a countryside covered with fields and growing crops, but only straggling settlements surrounded by a few ill cultivated patches and stretches of cleared forest on which browse a few goats or cattle. If we continue our journey still farther into the past, traversing the Neolithic Period and entering the Old Stone or Palaeolithic Period, which came to an end some eight or ten thousand years ago; we find that even the cultivated patches and herds of domesticated animals have disappeared. The sparse and scattered population of the country had then to depend for a livelihood on what could be obtained from moorland or from shore.

The industrial period in which we now live covers only a few centuries; the period of agriculture covers only a few thousand years; but the period of natural living, when Man was dependent on what fell to him from nature's table, covers hundreds of thousands of years. Tribes are Races in Microcosm Exactly how many we cannot yet tell, but everyone who has studied the evidence is convinced that this period of Man's existence covered at least half a million of years. This immense stretch of time represents the wilderness traversed by mankind in its evolutionary exodus to the promised land of to-day.

It was Man's formative period; it was then that he came by his characteristic brain, his qualities of mind, his intuitions and his inborn predispositions. As he climbed the ladder of civilization, his steps becoming ever faster and longer, he brought with him the mental inheritance gained in the 'Old Stone' wilderness. If we are to understand the racial manifestations which we see around us to-day we must first have a conception of the life led by our forebears during their long formative period. If we are to trace Man's social instincts to their beginnings—those social qualities which fit him to be a member of a family, of a tribe, of a nation

and of a race—we have to go still farther back in history.

Those animals which are his nearest kin in structure of body and brain—the gorilla, the chimpanzee and the orang—live in small family groups. We therefore infer that in his jungle days Man had already come by the rudiments of his social qualities, but it was during the long journey through the wilderness of his dawn that those rudiments blossomed into the rich complexity with which we meet in modern life. We shall find that

the Beagle sailed along Magellan's Strait in January 1833, with Charles Darwin on board, in order to land three natives of Tierra del Fuego who had spent two years in England, the great naturalist had an opportunity of seeing mankind still journeying in that primeval wilderness through which our forefathers had passed in their formative period.

Darwin found the population of that bleak and cold region broken up into a great number of sharply isolated groups, each group numbering from 120 to 150



THE FAMILY: AN EMBRYONIC RACE IN PRIMEVAL TIMES

Man's groups, which in these days of swift communication include millions of families and cover thousands of square miles, were once no greater than a single family or tribe; but it was in those far-off Palaeolithic times, when Man was acquiring the elements of his future civilization, that the seeds of race division were also sown. This family, reconstructed from remains of the Campignian culture (see page 220), though indistinguishable from its congeners, might have been a race in embryo.

Courtesy of American Museum of Natural History

the spirit of family merges into that of tribe, that of tribe into that of nation and that of nation into the spirit of race. In all animals save Man the discrimination of race is an unconscious or instinctive procedure. Even in modern man the process is still very largely subconscious.

For us who are seeking to unravel the history of the world and of its inhabitants it is a fortunate fact that progress is never universal; when the natives of Europe were entering upon an industrial civilization the natives of Tasmania, of Australia and of Tierra del Fuego had scarcely emerged from that of the Old Stone Age. The conditions of life which Captain Cook observed amongst the natives of Tasmania and Australia give a clue to the manner in which our ancestors lived in Europe 10,000 or 20,000 years ago. When

souls. Each group lived within its own demarcated territory; every member of the group or community knew the limits within which it was safe to hunt or fish. They had neither fields, gardens nor domesticated animals. 'Viewing such men,' writes Darwin in his diary, 'one can hardly make oneself believe that they are fellow creatures and inhabitants of the same world. They sleep on the wet ground coiled up like animals.' Looking over the side of the Beagle, he saw, under her bows, a frail canoe; a native woman, almost nude, was seated in it, fishing and holding to her breast a suckling child, with the snow flakes falling fast and melting on mother and child as they fell.

As the Beagle proceeded on its voyage Darwin kept a close watch day by day on the country and on its inhabitants.

The three natives, particularly 'Jemmy Button,' became excited as their homeland was approached. On January 22, 1833, Darwin made the following note:

After having passed an unmolested night in what would appear to be neutral territory between Jemmy's tribe and the people whom we saw yesterday we sailed pleasantly along. I do not know anything which shows more clearly the hostile state of the neighbouring tribes than these wide borders or neutral tracts. Although Jemmy Button well knew the force of our party, he was at first unwilling to land amidst the hostile tribe nearest to his own.

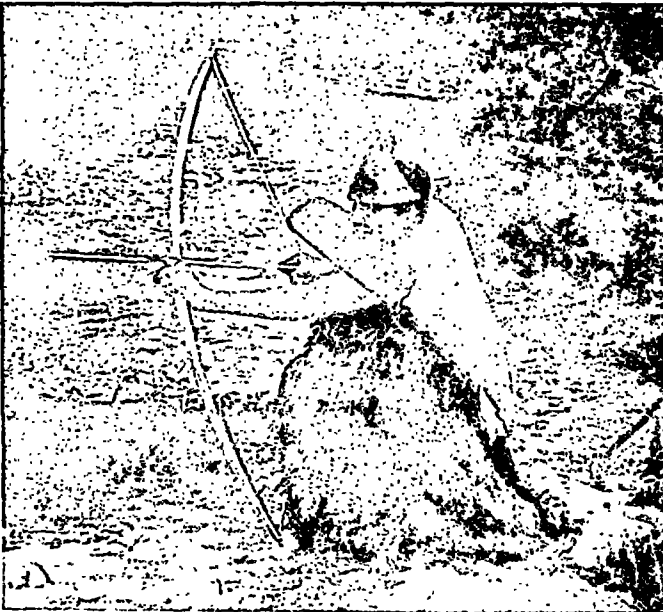
Darwin found in these territorial communities or tribes no apparent machinery of government; there was neither magistrate, policeman nor acknowledged chief; social life, so far as an onlooker could see, appeared to be regulated automatically. Each community or tribe, Darwin observed, was surrounded by other hostile tribes, 'speaking different dialects and separated from each other by a deserted border or neutral territory.' Each tribe was jealous of its frontiers; any encroachment was a cause of war.

Through Darwin's eyes we thus obtain a glimpse of the kind of regimentation

which existed in the great army of humanity as it made its long march from the jungle to its present position. Local communities or tribes formed its elementary units; and each company or community was officered, not by captains and sergeant-majors, but by that force which nowadays we call public opinion. The earliest origin of automatic machinery of the Tribal spirit government had been built as the evolution of Man's brain proceeded. We need not stop to inquire how the basal feelings became implanted in Man's mental life—the feelings of sympathy, of love, of hatred, of jealousy, of emulation and of pride. If we can believe, as I certainly do, that there exist forces in nature which can produce the beautiful machinery seen in our eye and in our ear, we need have no hesitation in believing that the social and regulative qualities of Man's mind have arisen in a similar way.

These qualities came into being, in the first place, to serve the needs of local communities, so small in numbers that each member of the community was known to the other. In each primitive local

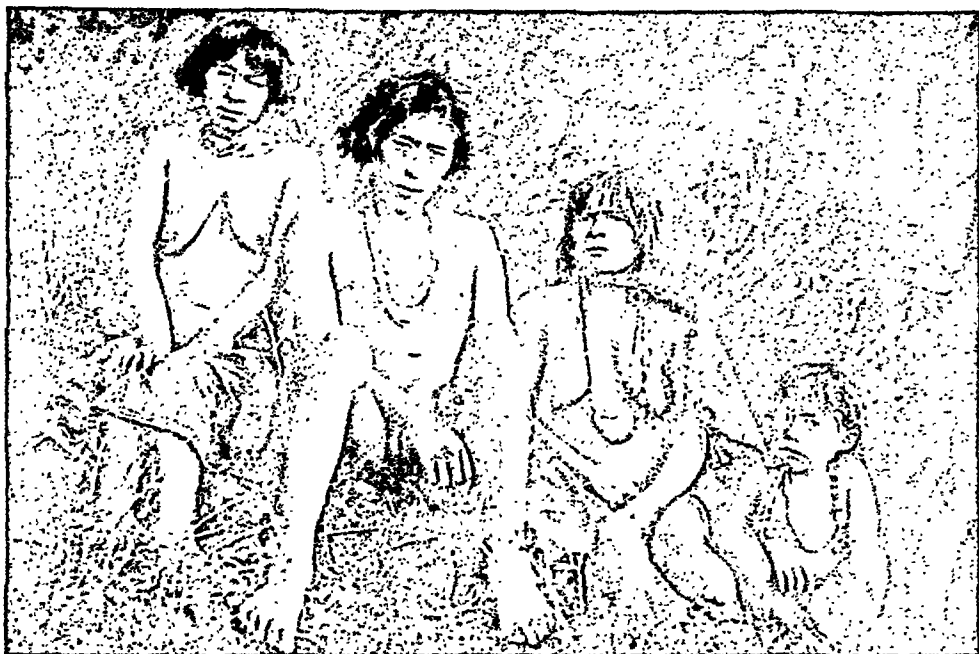
community each man, woman and child was daily and hourly noting the behaviour and thoughts of every other member of the community, assessing and re-assessing their estimates and comparing notes as to the result—just as is happening in every village of Europe to-day. One of Man's most deeply rooted desires is that which leads him to strive to gain the good opinion of neighbours. This automatic tribal mechanism which is implanted in the human mind works ever for the welfare of the tribe; men cannot restrain a feeling of admiration and of gratitude to the fellow tribesman who performs a brave act or who gives his life for the community. Blame, derision, scorn and contempt are powerful incentives to good



INDIANS THAT DARWIN ENCOUNTERED

To such fellow tribesmen as this Ona hunter of Tierra del Fuego, and to such a life as his, 'Jemmy Button' and his two companions were returning on board the Beagle in 1833 when Charles Darwin made his observations on tribal life.

Photo, W. S. Barclay



EVEN AMONG THESE SAVAGES THE SPIRIT OF NATIONALITY HOLDS SWAY

More wretched even, and more uncivilized, than the Onas, the Yahgans lead a life in the bleak climate of Tierra del Fuego as primitive as any to be found in the world. Yet even at their low level of culture, without any conscious machinery of government, a kind of group spirit—what we would call public opinion—is constantly operating to regulate conduct within the tribe.

Photo, W. S. Barclay

behaviour. Tribal life would be impossible were not Man's feelings capable of being easily roused to united action.

Even to-day we rebel against a direct and imperative command, while we obey if an appeal is made to our better feelings; tribal life would have been impossible had not Man's life been rendered sensitive to suggestion. Suggestibility is part of the old tribal machinery and so is intimidation, for if love fails to move men to common action, fear may succeed. The most cruel form of punishment which Man has devised is that known as solitary confinement, so deeply implanted in the nature of Man is the desire for fellowship. Primitive man could not live as an Ishmaelite; if he were born in Tierra del Fuego he had to remain a member of his mother's tribe, for all surrounding tribes were barred to him.

Thus we see that the primitive tribes which Darwin encountered as he sailed along the coasts of Tierra del Fuego, although they seemed to have neither chiefs nor law-givers, were not without government, but that government was

situated within them; they were ruled by an inheritance of feeling, emotions and passions which moved or impelled them to conduct life along certain definite lines. Under these conditions grew up all that is best in the heart and brain of Man—love of fellow tribesmen, sympathy with them when they were ill or sad, an irresistible tendency to rejoice with them when they were glad and prosperous, a readiness to avenge their injuries.

We see Jemmy Button's tribal spirit coming out when he boasted to Darwin of the superiority of his own tribe and country, and when he heaped abuse and contumely on all surrounding tribes. Herein we see this member of a primitive Fuegian tribe manifesting that spirit which is called 'patriotism.' Without a love of its country and a vaulting belief in itself, unless its members had love of it and showed a steadfast belief in it, no tribe could keep its place in the army of primitive humanity.

It is when we study human behaviour in primitive communities that we obtain an explanation of the complex and con-

tradictory elements which enter into the formation of human nature; for we can never understand the manifestations of the spirit of nationality and of race until we know how Man came by his intuitions.

Nothing puzzles philosophers more than the paradoxes that exist in Man's nature. Love and hatred, cruelty and kindness, hope and fear, courage and cowardice, are all to be found in one individual. Faith

Dual nature and mutual trust alternate with suspicion and treachery; on the heels of charity and magnanimity come back-biting and utter selfishness. Man can be polite and accommodating, but he can also, in another moment, be rude and insolent. He is at once credulous and suspicious. Under one set of circumstances a man will kill, rob, steal and break all the ten commandments; under another set of circumstances the same man will give all he possesses to the needy and sacrifice his life to avenge an act of cruelty.

When we note the circumstances in which Man's evolutionary journey has been carried out, such as can still be studied in remote parts of the Earth, we see how he has come by his double nature. One half of it—the good half—has been evolved for use within his community or tribe; the other half—the bad half—has come into being for use without the tribe. The good half strengthens the tribe from within; the bad half strengthens the tribe from without.

At the dawn of written history the population of Europe was still arranged in tribes. Even to-day, in the Highlands of Scotland, we can trace the old tribal or clannish organization of society. We need not enumerate here the historical events which transformed multitudes of independent tribes into united nationalities; it is enough to point out that nature's machinery was not destroyed in the process of fusion. Mutually hostile tribes may have been united into nations, but the international animosities of to-day play the same part in the process of isolation as the old intertribal enmities.

Nature's evolutionary cradles, under the conditions of modern civilization, have reached huge dimensions. An English

county measuring 5,000 square miles, which in primeval times could carry a local community or tribe numbering no more than five hundred souls—one to every ten square miles—may now, as a result of progress in agriculture, industry and trade, support a population of two and a half millions—five hundred individuals to each square mile. Among so dense a population the tribal spirit cannot manifest itself in the elementary manner seen in primitive tribes. Yet the tribal spirit is still alive even among the crowded masses of to-day. No matter in which village or locality in Europe we may choose to live, a few weeks' residence will reveal to us the workings of the tribal spirit.

Women reveal their tribal instincts by meeting to drink tea and talk gossip and to plan works of charity; men obtain relief for their tribal instincts by devoting themselves to competitive games and sports. During the cricket season each county and village of England follows the fortunes of its team and shares in its success and in its failure. During the football season men assemble in tens of thousands to encourage their chosen teams, exult in their victories and mourn over their defeats.

The great public has discovered many other innocent methods of exercising its ancient inheritance—the tribal spirit. We see this spirit at work

when men and women become divided into classes, and when industrial workers organize themselves into unions. Nowhere are the workings of the tribal spirit so apparent as among politicians—they arrange themselves into rival parties or tribes; every opinion or course of action that has the support of one's own party is right; every proposal made and every step taken by the opposing party is denounced as wrong. The methods of party discipline—intimidation and ostracism—are familiar to students of tribal organization. As we have seen, a threat to national well-being will mobilise and consolidate the tribal spirit of a whole country.

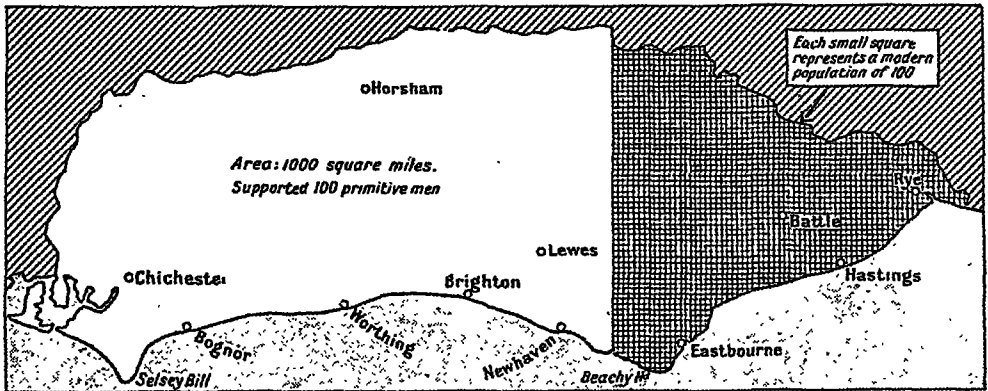
The greatest experiment in race building the world has ever seen is now proceeding throughout the length and breadth of America. Western Europeans call that

continent the New World, but several thousands of years before the end of the fifteenth century (when Columbus found his way across the Atlantic), America was already a New World to men of a proto-Mongolian stock.

If an anthropologist had surveyed the population of the world before Columbus sailed in search of new lands for the crown of Spain, his survey would have convinced him that Mongolian races or

tion, and for the differentiation of the Mongol type into local varieties. This was the anthropological state of the New World down to the end of the fifteenth century.

At that time certain important changes were taking effect in western Europe. Progress in agriculture was increasing the density of its population, while lessening in proportion the number of labourers required to produce an adequate food



SUSSEX IN PRIMEVAL TIMES: HOW THE TRIBE HAS GROWN

In the days before agriculture, and later still industrialism, had made possible the modern concentration of mankind, it is calculated that 1,000 square miles, which is the area left white above (roughly two-thirds of Sussex), supported 100 souls. To-day the same average actually lives in each of the 2,400 small squares drawn on the right-hand third of the county, a fifth of a square mile!

peoples held a winning position for the final conquest of the Earth. For at that period the yellow race occupied the greater part of the continent of Asia; it stretched across northern Europe as far westwards as Lapland; it swept towards the south until it flowed over the Malayan Archipelago and reached the islands of the Pacific Ocean. In America it extended from Greenland in the north to Tierra del Fuego in the south.

In Mexico and Peru the Mongolian American had built up densely populated and rich states, but elsewhere a strictly tribal arrangement prevailed. The rich prairie lands of North America were occupied by resolute and brave tribes who lived chiefly by hunting and fishing. How long America had been settled by primitive Mongolian types before Columbus and the Spaniards arrived we cannot yet say with any degree of certainty, but it was long enough to permit families of new languages to be evolved, and new varieties of plants and animals to be produced by domestica-

supply; the greatly extended use of gunpowder and of guns afforded a means of easy conquest; the invention of ocean-going ships brought America within reach of Europe. Then in the sixteenth and seventeenth centuries began two colossal experiments in race building and in race extension; these two experiments give us every opportunity of noting the part which race spirit plays in shaping the history of the world.

One was launched from Spain; under the Spanish flag a branch of the Mediterranean stock set out for the conquest of the New World. The other experiment was launched from the Saxon parts of England, and also from the Saxon shores of the Continent—particularly Holland. It represented an exodus of the Nordic stock or North Sea people, since the shorelands of the North Sea and Baltic represent the homeland of the Nordic type. How differently these two experiments have fared is known to all the world. Our main object is to ascertain why the Spanish experiment,

from an anthropologist's point of view, was a failure and the Saxon a success.

The motive which drew the Spaniards was not a true race movement—a search for a new home—but the spirit of military conquest and the capture of spoil. There can be no question that the Spaniards who shared in the early expeditions were brave and resolute men. They sought out the richest and most densely populated parts of the New World; they soon became masters of Mexico and of the most desirable

parts of South America
Spanish attempt (from the contemporary
at Race Building point of view); they
built cities, introduced

their form of government and their civilization. For the most part they left their wives and sweethearts in Spain and took wives and concubines from the native population, although the physical difference between the Spaniard and the American Mongol was such that each was recognizable to the other at a glance. The progeny of such marriages was neither Spaniard nor Indian; it had neither the stamina and resource of the Spaniard nor the amenable qualities of the Aztec. Thus arose in Mexico and the greater part of South America mixed and hybrid peoples.

In the nineteenth century one Central and South American people after another broke away from the mother country and launched itself on the sea of nationalism. The spirit of self-determination, a true manifestation of the tribal instinct, was everywhere evinced and prompted men to throw off the Spanish bonds. Thus the exodus from Spain has not established a new branch of the Mediterranean stock in America; it has proved to be a vast experiment in hybridism, and no one who measures the future prospects of a people by the degree of its political stability is likely to account the experiment a success from a racial point of view.

The lesson which this momentous experiment has to teach us is this: if there is aught of truth in the doctrine of race caste, then, when two races so diverse as the Spanish-Mediterranean and the American-Mongol meet, there ought to arise a feeling of intense antagonism—one which will keep them separate for ever.

From an evolutionary point of view they represent competing racial types which nature, labouring through a long age, has succeeded in bringing to a high stage of differentiation. We should expect that nature, ever careful of her types, would provide a machinery to keep them pure. Yet, as we have just seen, when these two types met in Spanish America they soon intermingled their diverse heritages of brain and body. We shall find the explanation of this anomaly when we proceed to study the second great experiment which ended in the Saxonisation of North America.

Dr. Robert Knox, who wrote so much, so often and so extravagantly concerning the mentality of the various races of mankind in the middle of the nineteenth century, declared that a traveller could tell the Saxon parts of Europe from the isolated position of the farms. He declared that the people who could claim to have Saxon or Nordic blood in their veins were the best of pioneers and settlers because of their self-reliance. In them the tribal spirit worked freely and openly; while other racial strains sought mutual protection in village communities, the Saxon, sword in hand, sought an isolated home in the open country.

He was strongly built, independent and courageous in spirit; he could labour as well as fight. His instincts were democratic; all the members of a tribal community claimed a share in the management of its affairs. They had a power of self-discipline and of subjecting their own interests to those of their tribe; but the interest of their own tribe they regarded as paramount. They never would admit that tribes of an alien people who stood in their way had any rights more than the sword gave them. Thus we see the tribal spirit working in its primeval way.

In the fifth century of our era people of this stock began to settle along the eastern seaboard of England. They brought their wives and families with them, and established homes and colonies. As in all true racial movements, the impulse which urged them to seek a new home arose from within; no government planned their emigration;

The Saxon Spirit
and how it works



DIFFERENT FATES OF THE RACES THAT COLONISED AMERICA

Two main streams of immigration have been responsible for the colonisation of America; the one from the coasts of the Iberian Peninsula, the other from the coasts of the North Sea. The first had the start of the second, but how the two fared subsequently is suggested in the map above. In the north we have a pair of states both Anglo-Saxon in ideals; in the south, a disunited group of republics, some of them in a chronic state of revolution, that contain but a small proportion of Iberian blood.

no shipping company tempted them by offering cheap fares; they built their ships and crossed the North Sea and continued to do so for three centuries. Their colonies spread throughout England, and the greater part of the country became Saxonised.

In the seventeenth century we see descendants of the Saxon settlers in England begin to repeat another movement of race expansion and to carry it out in exactly the same manner as their ancestors had done a thousand years before. They crossed the Atlantic and began to form colonies along the eastern seaboard of another hemisphere. They set out to establish new homes in a continent already inhabited by an alien race from Atlantic to Pacific. They took their wives and children with them; they created a new England, establishing within it their language, laws and traditions. They were an eminently 'moral' people with a tender conscience for all that concerned their own public and private welfare; they never regarded themselves as intruders; they dispossessed the natives of their lands just as their forefathers had done in England.

By the beginning of the eighteenth century the new colonies formed a continuous fringe along the seaboard and had com-

menced to spread westwards. By the middle of the nineteenth century descendants of the original settlers had carried English blood, English speech and English traditions, but under a new flag, to the shores of the Pacific and captured for men of European stock a part of the world as large as *World's largest* their original continent. In *United Nation* this way there came into being the largest united nationality in the world. It is now the aim of the hundred and ten million people who to-day compose the population of the United States to become 'a hundred per cent. American.' Herein we see the manifestation of the tribal spirit which swayed the old miniature units of humanity.

Our sketch of this great experiment in race building in America is necessarily brief; much has to be omitted. There is, however, one problem which we cannot afford to leave unprobed. Why were the results of the Spanish and of the Saxon experiments so different? How did the Saxon retain his purity of blood? We recognize that the sex impulse is one of the most impelling which has been established in the nature of Man—just as it is in all animals. Unless it were so, nature's work would come to an end. Man is the only animal which has a power of controlling this impulse; this virtue he has attained by reason of his higher and more recently acquired faculties.

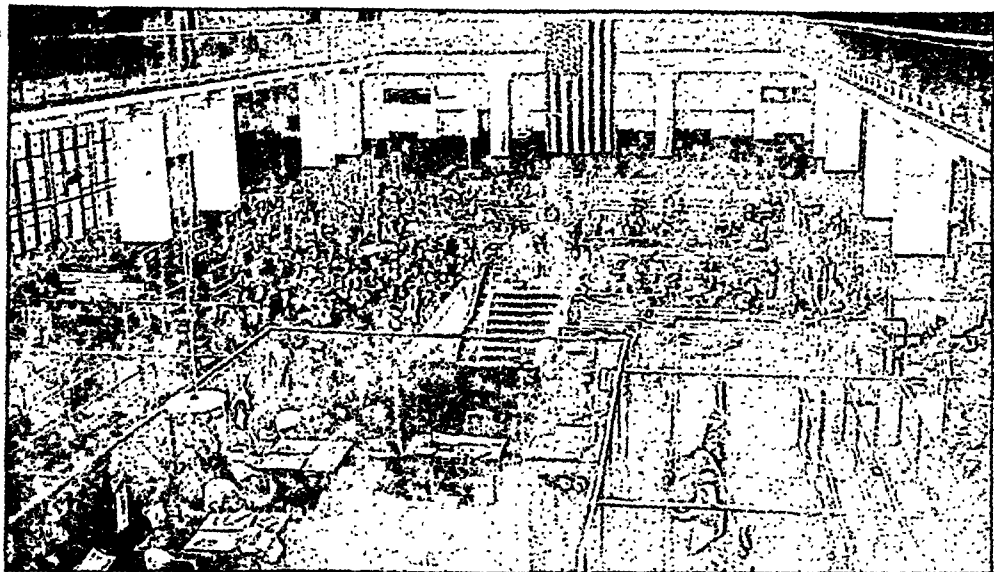
Nature, however, has not left his higher faculties unsupported; she has brought public opinion—the tribal spirit—to her aid. The Saxon, as he faced and had commerce with the Indians, was bound by all the ties of his home life; his womenfolk saw to it that the purity of race was maintained in their communities. It is said, and perhaps it is true, that a sense of race is more deeply grafted in the Saxon than in the Spaniard, but a survey along the frontiers where diverse and strange races come into contact will convince the



MANUFACTURING A NATION

As part of the machinery of that huge experiment in race building which we call the United States of America, night classes for young aliens are held in the New York schools. Here the curriculum includes teaching the pupils the meaning of the oath of allegiance to their adopted country.

Photo, Brown Bros.



RAW MATERIAL FOR AMERICAN CITIZENSHIP AT ELLIS ISLAND

Through the buildings of Ellis Island, that gateway to the New World, passes the yearly quota of immigrants from Europe whom the United States accept as citizens. Thirty-three million men and women, it is estimated, have left their homes since the Declaration of Independence: Germans, Irish, Swedes to-day, to-morrow patriotic citizens with their children '100 per cent Americans.'

Photo, Kadel & Herbert

inquirer that an isolated Saxon is no less liable to succumb to sexual temptation than a Spaniard. To maintain racial purity in a foreign land a people must carry with it all the parts of its tribal machinery; and the chief part is residence in homes among wives and children of the same blood. The Saxon experiment succeeded because it was a true tribal movement; the Spanish failed because it was not.

The establishment of a great national or tribal community such as is formed by the population of the United States could not have been effected in any former stage of the world's history. In early times, as the people spread across the new continent they would have broken up into territorial communities and nationalities, and there would have arisen in America the same network of national frontiers as in Europe. The formation of a tribe numbering well over a hundred millions in a land which may in the future contain as many inhabitants as are now to be found in the whole world was rendered possible by the annihilation of space—by means of roads, railways, steamboats and postal, telegraphic and telephonic intercommunication, and later by aeroplane and wireless. Schools established

throughout the continent teach a common language and a common tradition. Above all, the newspapers have become the vehicles for the dissemination of a common tribal spirit and tribal propaganda. The millions of inhabitants of the United States are more closely linked together now than were the natives of Wessex a thousand years ago.

It is estimated that since the people of the United States separated their connexion with the mother country thirty-three million people have crossed the Atlantic and made their home in this vast country. Of these four millions came from Britain and a like number from Ireland; between them Scandinavia and Germany have contributed six millions; the remaining millions were derived from southern and central Europe.

Each emigrant carried into his adopted homeland all that machinery of the mind which makes up a national or tribal spirit. Their children absorb as they grow up the language and tribal conditions of their adopted country. We see in this great modern experiment in race building that although the circumstances of life have been transformed, the tribal spirit has not changed; it is working in the genera-

tion now growing up in the United States just as strongly as it did in the local communities studied by Darwin.

When we inquire into human nature—that complex of primary feelings and reactions which are born within us—we find that there lie latent in our mental lives many impulses which become manifest only in special circumstances. The best tempered of men may, under provocation, burn with uncontrollable passion. It is so with our feelings towards races which differ from us markedly in a physical sense; we may live in our homeland for a lifetime, as most of us do, and be unaware that such a prejudice lies ingrained within our system of feelings.

The sense of race rises into consciousness and brings out its reactions only when diverse races are brought into actual contact. We may study the manifestations of race sense in the population of the United States better than elsewhere. Mingled with the hundred million men and women of European descent there are twelve million people whose homeland was originally Africa. They are distributed mostly in the Southern States, and in the eyes of the law are regarded as the equals of Europeans. Yet between white and black there lies a frontier, a colour-line as sharply defined and as jealously guarded as the frontiers of a kingdom.

Across this racial frontier all social traffic is barred, the custodians of the frontier being those who stand on the white side of the line.

Negro problem in America Any attempt to cross that frontier gives rise to mob war—the ancient way in which tribal instincts are manifested. These twelve million segregated citizens have seen millions arrive from Europe and pass freely through the national and social gateways—which for them are barred. In the course of a generation they have seen these new arrivals—men, women and children, born within the diverse nationalities of Europe and differing markedly in appearance and speech from the original colonial stock—received within the great white tribe, while they are kept waiting at the gate.

In the United States we thus see a tribal machinery at work which maintains

racial frontiers but breaks down all national barriers. National frontiers can be broken down because intermarriage produces a progeny which may pass undetected in the white population; but intermarriage between white and black gives origin to a progeny which is at once recognized by true members of the tribe as containing alien blood. No appeal to a sense of justice, equity or pity can overcome this race prejudice; we obtain light on it only when we approach the problem with the eye of a student of evolution.

With the development of ocean transport, and particularly its rapid improvement in the nineteenth century, the racial problems of the world

entered on a more acute phase than at any previous period of the Earth's history. Britain has flung her frontiers across the world and brought her people into direct contact with all the races of mankind. Never before has a bid for racial expansion been made more boldly.

The spirit and circumstances which made the early Saxon settlers of America maintain the purity of their blood still work in the British settlements of to-day. Everywhere these settlers have had to face grave problems of race; to many of these a solution has yet to be found.

The Australian colonists, in spite of economic inducements to pursue a contrary policy, have declared for a white Australia. Canada, as well as the United States, refuses to admit natives of eastern Asia. Nowhere in the world is a sense of race so keenly alive as in South Africa. The Dutch and the English have arisen from a common stock—the North Sea stock—yet in South Africa each has clung to the speech, traditions and sense of nationality derived from their mother countries. In spite of this rivalry, they agree on refusing equality to coloured peoples.

We cannot survey the more signal manifestations of racial instinct which flash out where diverse races come in contact without being convinced that a sense of race—a racial spirit—is not an assumed vanity which can easily be repressed by an effort of will, but is a feeling which proceeds from some intuition which goes deep into the grain of our mentality.

LANGUAGE: ITS ORIGINS AND HISTORICAL IMPORTANCE

Man's Babel of Tongues and what their Study can teach us of his mental Development and Past History

By JOHN FRASER LL.D.

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LANGUAGE is a product of society. It implies the existence of at least two persons, a speaker and a hearer, and its function is to convey an idea from the brain of the one to that of the other.

It is a matter of everyday experience that this can be done without using speech at all. Thus, assent or dissent can be expressed as clearly and emphatically by a nod or a shake of the head as by saying 'Yes' or 'No.' Moreover, we can not only express the bare idea of assent or dissent in this way, but can show without difficulty whether our unspoken 'Yes' or 'No' is decided or hesitating. But amongst civilized peoples cases of this kind, where a gesture is used habitually, are rare; and always the ideas to be expressed are of the simplest kind.

Certain tribes of American Indians are said to have developed gesture 'languages' of some degree of complexity, but it is not clear how far each separate gesture is a conventional substitute for a spoken signal, and not of independent origin. It is quite easy to suppose a community which had decided to use movements of the head or hands in place of such phrases as 'I am going away for a week-end,' 'Are you a prohibitionist?' 'Can you lend me your lawn-mower?' and the like. But though gestures can convey isolated ideas, they cannot readily indicate the relation between two ideas in the mind of the 'speaker.' This is true in an equal degree of the drum signals of Ashanti and other African tribes.

What distinguishes language, as a conveyer of ideas, from gestures, sound signals and the like, is that by means of language

the hearer is able to follow the evolution of a train of ideas in the mind of the speaker; every step in the development of the thought is, or can be, expressed in successive sounds. We have no longer isolated ideas, or isolated references to ideas, from which to construct for ourselves a vague, uncertain picture of what is passing in the mind of the speaker; we can follow the process step by step, and thus see how and why each idea follows the other.

Language has been defined as a system of articulate sounds used for the communication of ideas. This, like other definitions of language not greatly differing from it, is much too narrow. It is quite clear that it is based on a study of language which, notwithstanding the student's professions to the contrary, starts from the written word and continues to regard the spoken word as no more than what is represented by the written word.

But it requires very little investigation to convince us that even the most adequate alphabets enable us to represent on paper only part, and that not always the most significant. What writing part, of the mechanism cannot show by means of which the speaker has expressed his thoughts. This is well known, and expressions like 'the language of the eyes' do, in fact, remind us that in everyday conversation we normally use, to help in the expression of our thoughts, devices which are not articulate speech at all. Some of them, consisting as a rule of a peculiar intonation or stress, we can indicate on paper by exclamation marks, question marks and italics. But the overwhelming majority of them cannot be expressed in writing.

The little sentence 'You' may, with varying inflexion of the voice, varying expression and gesture, indicate recognition, curiosity, surprise or indignation. On paper there appears to be only one word; in the living language there are four, differing in sound and meaning. 'No,' accompanied by the appropriate expression of countenance, is often interpreted as an expression of assent.

It would be clearly illogical to say that the articulate sounds of the word 'No' are language, but that the accompanying gesture or expression of countenance, which alone determines the meaning of the word in the case imagined, is not.

While such auxiliaries to speech are used in all languages, it is noteworthy that they are very much more frequently used

in some languages than in others. This applies particularly to gesticulation, which is comparatively rare

among Northern peoples but plays a great part in the languages bordering the Mediterranean. No contrast in demeanour could be greater than that between a bartering scene in Aberdeen and one in Naples.

It is not likely that we shall ever be in a position to do more than speculate on the question of the origin of language. The oldest records of human speech from the valleys of the Nile and the Euphrates are modern, if we consider how long Man can be supposed to have existed on the Earth. There is nothing in the structure of Sumerian, as spoken some five thousand years ago in southern Mesopotamia, to justify our calling it primitive in the sense of being nearer to the first language, or as we should perhaps say to a first language, spoken by Man.

There is equally little information to be gained from the study of the languages of primitive peoples at the present day, though we can learn from it that a primitive form of culture is consistent with a language of extremely complicated structure. For example, one may refer to the languages of the North American Indians or of the Eskimo, which offer to a speaker of a modern Indo-Germanic language like French or English almost insurmountable difficulties.

But it is not necessary to infer from this that if we could follow a language, or a group of languages, backwards for, let us say, fifty thousand years, we should find the grammatical structure growing steadily more compact and, from our point of view, more complicated. It is possible to imagine a language originally simple and loose in structure becoming gradually more compact. Indeed we have signs of such a tendency in modern English in the growing practice of substituting quasi-compounds such as 'Test Match Result' for 'Result of Test Match.' Yet it is quite certain that the simplest ideas can be, and are, expressed in an extremely compact way, and it is, on the whole, likely that when man had arrived at the stage of forming sentences these resembled the Eskimo 'sinikatachpok,' rather than its English translation, *he-is-ill-from-having-slept-too-much*.

Speech is not inherited. Each individual acquires it for himself from his elders. What would happen if a child were brought up in complete silence, so far as human speech is concerned? It is quite certain that, given hearing, he would not be dumb. He would hear and imitate natural sounds, the cries of animals, the noise of running water, the moaning of the wind. He would associate with the sounds the appearance of the creatures that produced them or the phenomena which accompanied them.

If we imagine a community of such children, it is not difficult to see that the articulate sounds with which they imitated the cries of animals could come to be used as names for the animals. We know, as a matter of fact, that children in normal surroundings do use names like 'bow-wow,' 'quack-quack'; and all languages have a number of such words as part of their ordinary vocabulary. It will be sufficient to mention the English cuckoo, peewit, boom, plop, crash, fizzle. There can be no doubt whatever that the imitation of natural sounds did contribute to the beginnings of language, but this—'onomatopoeia'—is not the sole source.

Here, as elsewhere, it is misleading to look for a single cause, and we should set up, not as a rival to the onomatopoeic theory of the origin of language but as it comple-

ment, the other most satisfactory theory. This assumes that movements of the body, of hands and feet, would be accompanied by cries which, within the family or community, would in course of time come to be standardised. Once all the members of a community had agreed to utter the same sounds when stretching out the hand, or looking at the sun, or peering into a dark corner, then the sounds alone would suggest the thing pointed at or the action performed. The onomatopoeic theory and the gesture theory are possible contributory factors in the early development of language. There must have been many others.

It is comparatively easy to see how the names of familiar concrete things and actions could have originated; much more difficult to imagine the process by which names were given to abstractions like truth, justice, hope. It will help, however, if we observe how in the history of recorded languages words which originally denoted tangible and visible things and actions were, and still are, continually drafted into the vocabulary of abstractions, and how easily, through a complex series of associations, words acquired new and often unexpected meanings.

Thus the Latin 'anima,' soul, as can be safely inferred from its certain connexion with the Sanskrit 'aniti,' breathes, 'anilas,' wind, must have

Making terms for abstractions originally meant breath. Once the conception of a spirit had been evolved, and its presence in the body or its absence from the body had been associated with the continuance or the cessation of breathing, the transference of the name of a thing evident to the senses to something which was not became almost inevitable.

It is interesting to find that the same kinds of metaphors are used in different languages. The Latin 'spes,' hope, which is etymologically connected with the word space (itself borrowed from the Latin), indicated a mental attitude by the suggestion of the future with its possibilities as a wide expanse stretching out before the eye. In Arabic, when a person experiences relief or joy, it is said that 'his chest expands.' In this case there is described an actual physical sensation

which often accompanies the emotions in question, and the development in the meaning of the verb was easy. We can thus see one way in which names of concrete things and actions could be made the basis of names of intangible things:

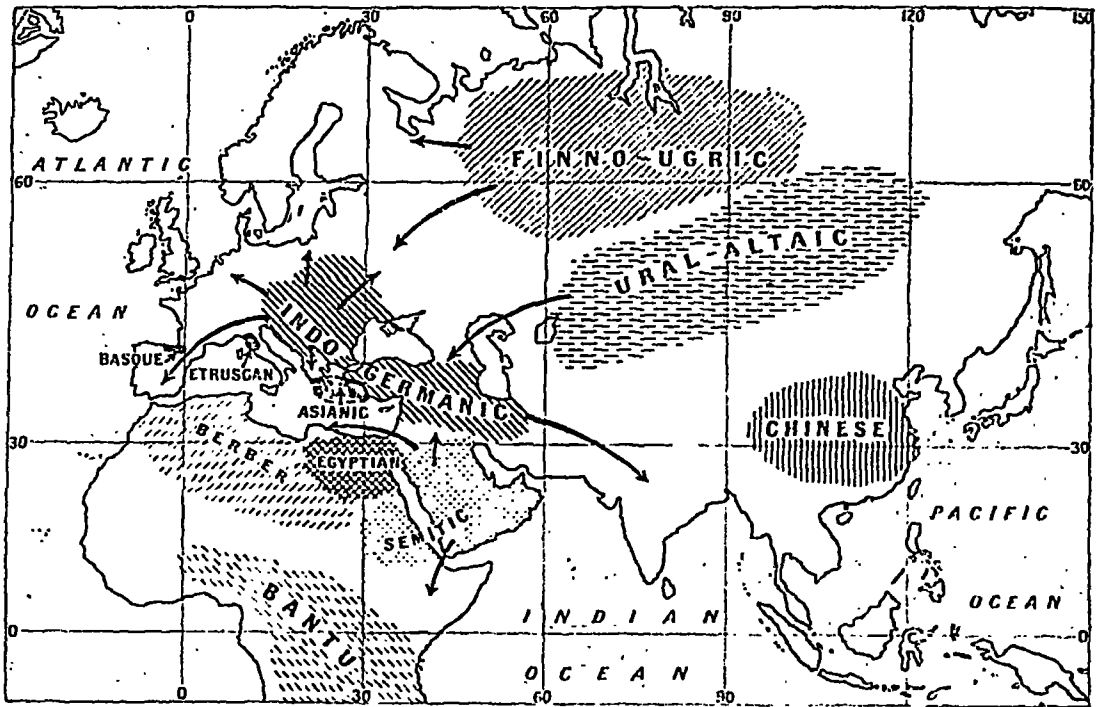
The number of existing languages is very large. Already well over two thousand have been described; some of them, including European languages, very minutely; Tongues and how others, like certain American languages, only in outline. The number mentioned takes, of course, no account of dialects. The question at once presents itself: Do all those languages go back to the same origin? Are they all developments of one original language?

The majority of scholars would probably reply in the negative. The case for descent from one language, 'monogenesis,' has been put very strongly by the Italian scholar, Trombetti, but has secured comparatively little support.

It has been suggested that the poor development of the lower jaw in certain remains of prehistoric man indicates that he did not speak. But conclusions cannot be based on evidence of this kind. Existing languages vary very greatly in character, but the human race has had a very long history, and it would be bold to say that the various types of languages that we know could not have evolved from one original. The question must be left open.

On the other hand it can be shown that certain groups of languages have diverged from a common ancestor. Thus, in the case of the Semitic languages, a group comprising Hebrew, Aramaic, Assyro-Babylonian, Arabic and Abyssinian, the coincidences in vocabulary and grammatical structure are so numerous that a competent knowledge of one of them will enable us to read the others, except possibly Abyssinian, with very little preparation. We can say that the language from which the known Semitic languages are derived cannot have been very unlike its descendants.

In other cases there is not the same degree of certainty. Thus, although the northern and southern groups of the languages spoken in the Caucasus certainly



PROBABLE CRADLES OF EIGHT GREAT FAMILIES OF SPEECH

This map is intended to indicate how the chief groups of languages in Europe, Asia and Africa, of which evidence survives, may have been relatively situated in prehistoric times; the arrows show their main lines of extension. It must be remembered that the position assigned to each group is, necessarily, tentative, and is based mainly on linguistic evidence for contact between groups, for this reason Semitic appears in Africa. 'Asianic' denotes the pre-Hellenic languages of the Aegean world.

From material supplied by Professor Fraser

have features in common, they diverge so greatly in other respects that with our present knowledge a common origin cannot be asserted. Other languages, again, are isolated. Basque, which generations of investigators have sought to connect with other languages as far apart as Italy and India, still remains without any known relations. The same is perhaps still true of Etruscan, the mysterious language of a mysterious people which Latin displaced in northern Italy (see Chap. 38); though here there are signs that relatives may eventually be found.

Languages are classified according to similarity of structure, the way in which the interrelation of the different parts of the sentence is indicated. We find that there are many different degrees of similarity, and that while a general similarity need not indicate a common origin, similarity in detail does. In the latter case we shall expect to find that the similarity in structure is accompanied by many coincidences in vocabulary.

There are instances, however, where a very striking structural similarity, the use of the same grammatical devices, is found in languages that can never have been in contact. Thus in Quichua, a group of dialects spoken in parts of Peru, Ecuador and Bolivia, the flexion of the noun is effected in both numbers by the use of the same suffixes, the plural being distinguished only by the insertion of an element, '-cuna-', between the stem of the word and the case termination. In Osmanli Turkish an element, '-lar-' or '-ler-', is used in exactly the same way and for the same purpose. Naturally this coincidence in a particular detail of structure is a pure accident, and shows that we may expect to find, in a group based on similarity of structure, languages of entirely different origin.

On the other hand related languages may diverge so much in the course of time that an examination of the structure of the sentence or of the flexion of the noun would not, by itself, be sufficient to

establish their historical connexion. Thus English, an Indo-Germanic language, has abandoned the original free arrangement of words in the sentence ; in modern English the place of the word in the sentence is almost as important as in Chinese. In Classical Sanskrit, another Indo-Germanic language, we find that the earlier construction of the sentence, involving the use of conjunctions to introduce co-ordinate or subordinate sentences, has been replaced by the use of verbal participles and compounds, often of enormous length. The verb, which in the earlier Vedic Sanskrit had a richly developed system, retains only a few forms, which are used as rarely as possible.

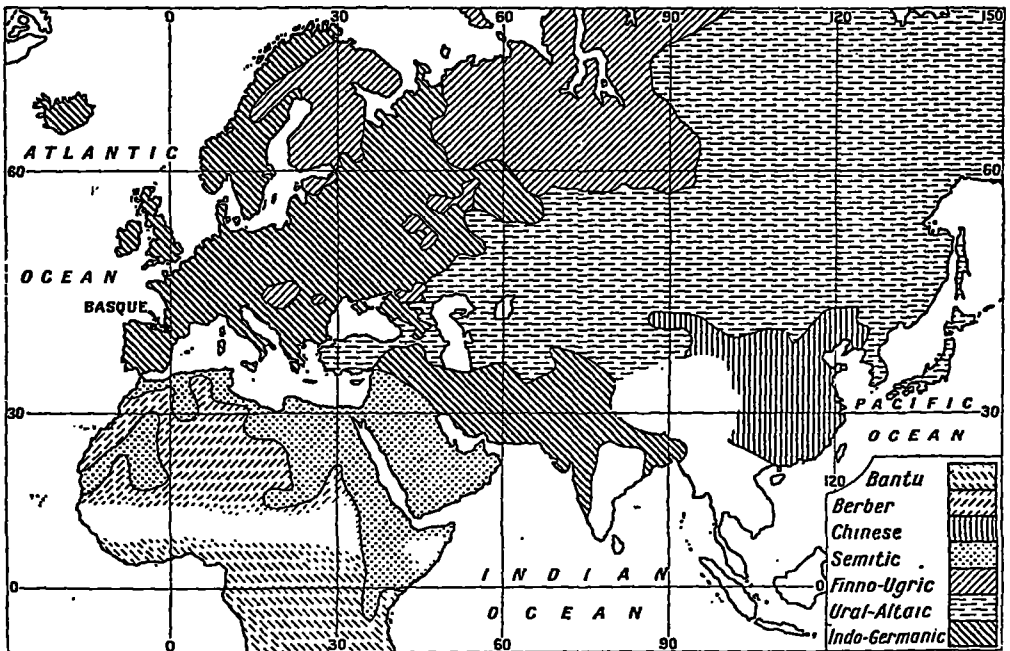
From these two out of many possible examples it is clear that languages do not remain true to type. But there is the further conclusion that any given language may present peculiarities associated with a different type of language.

It has been said above that similarity of structure when it extends to details may point to historical connexion between

the languages in which it appears. It may be due to borrowing on the part of some or all of the languages concerned. It is highly probable that the innovations in the structure of the sentence in Classical Sanskrit are due to the influence of other Indian languages of a different type, and it has been suggested that certain peculiarities in the Celtic languages have been borrowed from the language, or languages, of the pre-Celtic population of the British Isles.

When two languages show structural peculiarities in detail, and have, in addition, a great number of coincidences in vocabulary, we can postulate a common origin, or say that one of them is a development of the other. Now, in Latin and Greek we find that there is not merely a general similarity, in that both use flexion to show the relation of the words in a sentence to each other, but that the flexional elements are in a very large number of cases identical.

If we take the Latin word for horse, 'equos' (to use the older spelling), and



PRESENT DISTRIBUTION OF LANGUAGE GROUPS IN THE OLD WORLD

Seven linguistic families dominate the Old World to-day. It must not be thought that they were the only competitors ; many, like Egyptian, may have perished in the struggle. Thus between the Berber and Bantu areas there is still a band of tongues grouped loosely as Sudanic, though they almost all have marked affinities with one side or the other ; while in India and the Malayan world there are the Dravidian and other groups, of ill-determined affinities, that are too diverse to classify.

the Greek 'hippos,' we see that, in the singular, the nominative has the same termination. The accusative is, in Latin 'equom,' in Greek 'hippon,' and we happen to know that the termination '-on' of the Greek form has taken the place of an older '-om.' And so with other cases, which in the two languages are either identical or can be connected with each other. We find, moreover, that this correspondence in the form and function of flexional terminations holds not merely in occasional instances, but is characteristic of the whole body of the languages in question.

We find, too, that important parts of the vocabulary of the one language are represented by identical words in the other. The Greek 'ego,'

Indo-Germanic : I, 'eme,' me, are clearly identical with the Latin 'ego,' I, 'me,' me. The Greek numerals 'duo,' two, 'treis,' three, 'okto,' eight, 'deka,' ten, can be seen to be identical with the corresponding Latin numerals 'duo,' 'tres,' 'octo,' 'decem.'

It is obvious that these correspondences in both form and meaning cannot be due to accident. We must assume that the one language has borrowed from the other its structure and a vast mass of vocabulary, or that the one language has been evolved from the other, or else that they are both independent evolutions from an older language. But when we find that Latin has peculiarities in structure and vocabulary which are not found in Greek but do occur in Celtic and in the Germanic languages, and that Greek has features unknown to Latin but found in Sanskrit and in the old languages of Persia, we recognize that neither the theory of borrowing nor the theory that any of those languages has been evolved out of the other explains the observed facts.

The only explanation is that all these languages, Greek, Latin, Celtic, Germanic, Sanskrit, represent independent developments of one older language, precisely as the Romance languages, Italian, French, Spanish, have grown independently out of Latin. It is customary to speak of families of languages and of parent languages. Thus the Romance languages form a family, and Latin is the parent

language. In this case we have written records of the parent language, and we can assure ourselves that a very large number of the features and characteristics of the mother survive in the daughter.

But if all record of Latin had been lost we could, nevertheless, by comparing the features of its descendants, arrive at some probable conclusions as to its appearance; we could, to a large extent, reconstruct its vocabulary and we should know a great deal about its grammar. The parent language of Latin and Greek, Celtic and Germanic, Slavonic and Sanskrit and the other languages that constitute the Indo-Germanic family survives only in its children; their resemblance to each other is our only guarantee that they are descended from one parent, but it is sufficient, and the facts can be explained in no other way.

The Indo-Germanic languages, which include nearly all the languages of modern civilization, have been more carefully studied than any others, and their history and mutual relationship are better known than those of the members of any other family. There are, however, some other groups of languages of which we know enough to be able to say that they constitute families, that each group of separate languages represents the divergent developments of one original language.

The Semitic family has been mentioned already. In northern Europe and Asia we have a large number of languages, of which the best known are Finnish, spoken in Finno-Ugric Finland and in parts and Ural-Altaic of Norway, Sweden and Russia; Lappish in the same regions; Esthonian on the south coast of the Gulf of Finland; and Cheremissian on the Volga. These, with Hungarian, which was carried into central Europe from the northern steppes somewhere about the ninth century, form the Finno-Ugric family. Osmanli-Turkish is one of a large group of languages, extending from Transcaucasia through central and northern Asia to Mongolia and possibly including Japanese, which is generally known as Ural-Altaic. The study of the different members of this group is not sufficiently

advanced to justify the positive statement that the resemblances between them must be due to a common origin, and not in part, at least, to borrowing. Of families of languages not represented in Europe, the Bantu languages of central and southern Africa must be mentioned. Over two hundred in number, and spreading across vast areas, they have yet preserved with remarkable unanimity the characteristic features of the parent tongue.

Latin and Greek, as descendants of the Indo-Germanic parent language, stand to each other in the same relation as do French and Italian, two descendants of Latin. It has been frequently asked in recent years whether the Indo-Germanic parent language itself may not have been similarly related to the languages from which other families have been evolved.

A very elaborate case for the relationship of Indo-Germanic and Semitic has been made by the Danish scholar, Möller, but has not had much support outside Denmark. It has similarly been supposed that the parent languages of the Indo-Germanic and the Finno-Ugric families must have been related. In the former instance the demonstration

Groups that may be connected is unconvincing, because it rests on unprovable hypotheses regarding resemblances in vocabulary, which are too vague and, certainly in many instances and possibly in most of them, are due to accident. On the other hand, the resemblances between Indo-Germanic and Finno-Ugric do probably indicate historical connexion, but whether they are the result of early borrowing or of a common origin cannot be definitely stated.

Languages grow by modifying their native elements and by the adoption of new material from outside sources. Of the latter method there is no better example than English, which, while retaining and developing the native Germanic element, has added enormously to its resources by borrowing from nearly every language in the world. It may be observed that extensive borrowing from without goes hand in hand, as a rule, with comparatively rapid phonetic and morphological change in the native elements of speech. The reason appears to be that the active inter-

course with foreign peoples which is the main cause of the importation of words leads at the same time to a rapid modification in the native elements.

The language of a people which leads a secluded life, on the other hand, may undergo very little change for thousands of years. Lithuanian, spoken in what was till a few years ago a quiet backwater, far from the crowded trade routes of modern Europe, Languages that still preserves much of resist change the complicated grammatical machinery which most other modern Indo-Germanic languages discarded centuries ago. A similarly archaic character, due to analogous causes, may be seen in Icelandic, as compared with the Scandinavian languages of the mainland which have been in close touch with the political and commercial activities of Europe.

It is probable that the highly conservative character of Arabic, in contrast with Hebrew and Assyrian, is to be explained in the same way. The Beduins speak a language preserving some characteristics of early Semitic which had already disappeared in Hebrew and Assyrian long before the Christian era, because the Beduins have continued to live the monotonous life of the desert while the Jews and the Assyrians came at an early date into touch with the busy life and complex civilization of Egypt and Mesopotamia.

We can conjecture some of the circumstances which make changes in the sounds and the grammar of a language easy. Thus the rapid simplification in the flexion of the noun which, among other things, distinguishes Middle from Old English must have been due in large part to the Norman conquest and the introduction into England of a new language. The sound-changes known as Grimm's Law, which, for example, turned the first consonant in the word corresponding to the Latin 'tres' into 'th,' and so gave rise to the English three, have been explained as due to the difficulty found by certain peoples of central Europe in pronouncing the new Indo-Germanic language introduced to them.

Apart from changes due to what may be called a foreign element, languages are constantly changing in the mouths of

native speakers. A language is transmitted from one generation to another by the process of imitation, and imitation is not always perfect. A word is mispronounced, the mispronunciation becomes general and then ceases to be a mispronunciation. Language, indeed, develops by means of a series of mistakes.

A language mirrors the ideas, the experiences and activities of the individuals who speak it. When we invent a new game we give it a

History mirrored in Language new name, and call it Rugby: when we borrow

a game we borrow its name, or the name of a thing associated with it, and call it Polo. From those two names alone it will be possible for the historian of the future to say with assurance, even if all other source of information should be lacking, that the kind of football called Rugby was invented by an English-speaking people, and that an English-speaking people had some connexion with India.

An examination of the words in English that refer to religious ideas, buildings and ceremonies, such as prayer (Latin 'precari,' through the French 'prier'), vow (Latin 'votum,' through French 'vœu'), dean (from Greek 'diakonos,' through Latin 'diaconus' and French 'doyen'), cathedral (Latin 'cathedra'), nave (Latin 'navis'), mass (Latin 'missa'), will show, without any other evidence, that Christianity was introduced into the British Isles through a Latin medium. The significance of the presence in English dictionaries of the Italian musical terms fortissimo, allegro and the rest is equally patent. And, to come down to the present day, the constant use in grammatical works of words like 'umlaut' and 'ablaut' shows the immense influence that German grammarians have wielded during the last century.

In the examples mentioned above we have independent evidence to confirm the inferences based on words alone. But when we go further back, beyond the range of historical records, the study of the vocabulary of a language, of the movements of words and their etymologies, if carried out prudently, can tell us much about the people who spoke it.

Thus, the fact that the Germans borrowed their word for kingdom, 'reich,' from the Celts at a very early period is beyond dispute, and it clearly proves that something in the nature of a monarchy was known to the Celts of central Europe before the Germans had use for the institution; and we are prepared for the discovery, since we know from other sources that in the centuries immediately before the Christian era the Celtic-speaking peoples of the Continent were more highly developed politically than the Germans. From the Romans the Germans borrowed the name of wine, and we can safely assume that they adopted the Roman name for the reason that the Romans were the first to introduce them to it.

They borrowed at the same time the Roman names for what we should call a publican and for the mugs in which he sold his wine over the counter. When we speak to-day of 'cheap'-jacks and 'cans,' we do so because, when the Roman legionaries went in the first century of our era to keep the watch on the Rhine, there followed close on their heels the enterprising Roman inn-keeper (caupo) with his wine-jugs (cannae). It is not difficult to picture the enthusiasm with which the wild German tribesmen, who had hitherto drunk nothing better than their native mead, swarmed into the Roman inn to drink wine from the shores of the Mediterranean and enjoy all the luxuries which defeat had brought them, and to learn the words with which to ask for them.

Some interesting light is thrown on the very early history of the speakers of the Indo-Germanic languages by a peculiarity of their numeral system.

In all these languages **What Numerals** except the Germanic and **can reveal**

Lithuanian the names of numbers from eleven to nineteen are formed by combining the names of the digits, one, two, three and so on, with the name for ten. Thus in Latin we have 'undecim' (uno+decem), 'duodecim' (duo+decem), 'tredecim' (tres+decem), and so on. In English and the other Germanic languages, on the other hand, the names for eleven and twelve have special forms not containing the word for ten, which reappears,

however, in the names of the numerals from thirteen (three + ten) onwards.

To put it otherwise, while Latin has a pure decimal system, the Germanic languages and Lithuanian have a decimal system crossed by a duodecimal. There are other traces of the duodecimal system in English. We speak of a 'long hundred' (10×12), which reminds us that in Icelandic the similar word corresponding to the English hundred originally meant 120. We have borrowed the word 'douzaine,' dozen, from French, but we have not borrowed 'dizaine.' We divide the day into twelve hours multiplied by two, and the hour and minute into another multiple of twelve. We divide the pound by the decimal system but the shilling by the duodecimal. It is clear that there must have been some cause other than arbitrary caprice to account for this phenomenon.

A very probable explanation is the following. The Sumerians, the ancient inhabitants of southern Mesopotamia (see Chap. 16), are known to have used the duodecimal system of reckoning, possibly owing to the discovery that the year contained approximately twelve lunar periods; and from them, or rather from their successors the Assyrians, Sumerian ideas this method of reckoning spread to Europe must have spread to the north and west. There

are slight traces in the Greek numeral system of influence by the duodecimal, and the Greeks actually appear to have borrowed the Assyrian name for 60 (12×5). The really interesting question suggested by these facts is this: Why should the influence of the duodecimal system be found almost exclusively in languages which in historical times have been spoken only in northern Europe?

There can be little doubt that the habit of reckoning in twelves must have come to Europe along the great trade routes which led overland in prehistoric times from the highly civilized countries of western Asia and Egypt as far north as the Baltic, the shores of which furnished the ancient world with amber. Lithuanian, which shows even more strongly than the Germanic languages the influence of the duodecimal system, is still spoken on the shores of the Baltic, and one is tempted

to speculate on the possibility that the linguistic ancestors of the Lithuanians, and those of the Germans, may have occupied the same areas four or five thousand years ago. This has been supposed on other grounds, and we may see in the remains of Mesopotamian influence on the languages round the Baltic a further argument in favour of the theory.

Occasionally a language grows weak and dies. The people who spoke it do so no longer and acquire another tongue. It must be observed that when we speak of 'dead languages' in referring, as we generally do, to Latin and Greek, we use a very loose and misleading expression. Greek never for a moment ceased to be spoken, nor did Latin. In both instances the form of the languages has changed, but the continuity of the Latin language from our earliest records of it down to the last issue of the *Journal des Débats* or of *Il Popolo* has been as little broken as that of the English language from Alfred's time to the present day.

Latin and Greek are 'dead' only in the sense that a particular stage in the history of each, which happens to be well known to us, has been passed. The English of Chaucer, too, is dead. But when a language dies in the proper sense of the word, all that remains of it consists of isolated words, growing gradually fewer and fewer in the language which has taken its place. In this sense Cornish has been dead for over a century, though traces of it still survive in the English as spoken to-day in Cornwall.

Why the speakers of a language should gradually abandon it in favour of another is sometimes clear. The spread of the Roman Empire in western Europe led to the extinction of the native languages in Spain and Gaul and along the lower reaches of the Danube. There is no evidence that there was any reluctance on the part of the Spaniards or Gauls to adopt the language of the conqueror.

On the other hand, in the eastern parts of the Empire, where Greek had long been established, the subject peoples did not learn Latin, and the Romans made no attempt to induce them to do so. It is

simple to say that Latin prevailed in the West because the Romans were dealing there with an inferior kind of civilization, while in the East Greek persisted because it was the language of a culture superior to that of the Romans. But that does not really explain why in some cases a people will abandon its own language readily and in other cases cling to it tenaciously.

We know that Czech, the Slavonic language of Bohemia, was resuscitated when on the point of extinction, although it had to fight with German, the language of a superior and more powerful culture. Welsh promises to survive for centuries, though it is the language of a small minority surrounded by, and mixing with, the speakers of a language which represents a more advanced culture. In Ireland we see going on at the present moment a movement, due, it is true, to a small number of idealists, which aims not merely at preserving Irish as the language of the peasants, but at making it the official language of the Free State. It is evident from these and from many other examples that could be mentioned that a language does not necessarily die out simply because it comes in contact with the speakers of a more highly developed civilization.

The language of a people is not merely the medium by means of which the speakers communicate with their fellows.

It comes, particularly when it has acquired a permanent form in literature, to be an expression of the spirit of those who speak it. Its sounds and idioms are peculiar to them, something which no other peoples have. Its whole character is what it is because it has grown up in those surroundings and on the lips of those speakers. The Englishman who, on having it explained to him that a Frenchman apparently shouting 'pong' was asking for bread in his own language, insisted that it was 'bread all the same,' expressed a very general and natural feeling.

Our own language is to us something more than an object of scientific investigation. A person who speaks it is for us a human being in a sense in which a person

who does not speak it cannot be. We are aware that he has at least some of the same likes and dislikes, is familiar with the same general surroundings, and will, in given circumstances, act in the same way as ourselves. There is nothing more difficult to define than this consciousness of community, of nationality. Racial community is clearly not essential, for a Jew may be a good Englishman and have the national feelings of an Englishman. Under normal conditions the individual shares the national feeling of those with whom he lives.

This, too, is true of language. Normally, the language of an individual is the language of his neighbours. As a rule, when we ask what the nationality of an individual is, we infer from the reply what his language is. We should find some difficulty in calling a man an Englishman who spoke only Italian. It will perhaps be right to say that, normally, a common language is the outward expression of common ideals and common ideas. A foreign language suggests ideals and ideas which may be strange to us.

When a people gives up its language for another it announces, not necessarily that it is culturally inferior, but that it is no longer conscious of anything in its culture or in its ideals that cannot be adequately expressed in a foreign language. The time taken to impose a new language on a community will depend on a great variety of factors. It will be comparatively short in a place like the Scottish Highlands, where the population is sparse and economically dependent on the speakers of the foreign language. It will be longer in Wales, partly because the economic conditions are here more favourable, but also because, through the churches and the Sunday schools, the Welsh language has been an integral part of the religious life of the people.

The economic factor will be in the last resort decisive where there is any considerable disparity between the economic conditions of the speakers of the two languages. In these cases the 'superior' civilization is that which can best provide for physical needs.

CLIMATE & GEOGRAPHY : THEIR INFLUENCE ON HISTORY

How the Current of Man's Actions in his Struggle for Existence has been directed by Environment

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IN the largest interpretation of the scope of history, the word as used of Man bears much the same sense as when we speak of the 'natural' history of any other living being. It takes account, on the one hand, of the equipment and faculties of Man himself, by which he is enabled to maintain his own existence and to provide someone to replace himself when his own efforts cease. History must also, however, study the world of external circumstances in which Man lives, and the various ways in which his freedom to live as he desires is restricted by those circumstances; and also the various facilities for self-expression which lie always ready to his hand, provided only that he has the intelligence and the will to make use of them.

It has been a popular and widespread belief that 'men are born equal'; but common sense and common knowledge challenge this belief at every turn. Children of the same parents differ in stature and endurance, in wits and temper, in docility and enterprise. Mankind consists of many breeds and races of men, specialised like the breeds of domestic animals; and, like the natural varieties of many wild creatures which have a wide range, has become adapted to different conditions of existence.

On the other hand, even among the most closely similar individuals, whether men or animals or plants, external circumstances unfavourable to healthy energy not only limit their range of opportunities, but impair their endurance, vitality, initiative and, in general, their ability to take advantage of opportunities which are

actually there. Cabbages flourish ill or well in poor or rich soil; in parched or sodden pastures sheep cease to thrive; men, too, in Arctic cold, or tropical rain forest, lose energy and resourcefulness; and this in different degrees according to their breed and individual characteristics.

These external circumstances are, at first sight, bewildering in their complexity. But by distinguishing even quite broadly the principal factors in this complex environment, and tracing separately the geographical distribution of each, it is possible to detect in their interaction certain broad uniformities, to recognize and describe the principal kinds of environment and to classify the principal regions of the Earth's surface where they severally occur.

Within every such group of similar regions we should expect—and we do actually find—the experiences of their human population to exhibit general resemblances. All desert regions, for example, and all dense forests respectively permit only certain kinds of human activities and enterprises; and exhibit, in general, the same kinds of social and even political organizations, modified only, in the same general sense, by the different breeds and varieties of Man which have had access to each region.

Now, the principal orders of phenomena with whose interaction we are to deal have already been considered and explained in Chapter 2, *The Making of the Earth*; and we need not recapitulate the distinctions between lithosphere,

Society related
to Environment

hydrosphere and atmosphere, nor describe the properties of life and the circumstances of its first appearance on the Earth—which have been the subject of enquiry in the same chapter.

What 'life' is we do not yet know; what we do know is that on this Earth 'living' things can only be maintained and propagated in conditions where all four primary factors, or 'elements,' as the first students of nature called them, are present: earth, water, air and solar energy. In a few regions there is so little moisture that it is difficult to detect the presence of any form of life; but usually various forms of life exist as a fairly continuous film or layer upon the surface of the soil, such as the turf of a grass-field; and if moisture and solar energy are sufficiently plentiful, as in a tropical forest, the 'phytosphere,' or terrestrial envelope of vegetation, is many yards in depth and very dense.

Now, though those forms of living things which we call 'plants' obtain all the materials for their growth directly from atmosphere and soil, at the cost of being more or less firmly rooted to the land surface, those others which we distinguish as 'animals' cannot do this. They

depend for sustenance either on various kinds of plant, and are sufficiently capable of locomotion

to extend their browsing over considerable distances, or on capturing and consuming other animals. Migratory as they are, however, the movement, and consequently the geographical distribution, of animals is strictly limited by the range of the plants on which they, or the creatures on which they prey, live.

This more or less continuous planetary envelope of animals and plants—let us call it the 'zoosphere,' or Earth's covering of living things—is slowly but constantly circulating, like that of the atmosphere and the sea. The limits of the area to which each animal and plant is restricted are ever changing under the influence of variations of moisture and temperature, whose past effects we see in the succession of geological flora and fauna. This ceaseless circulation of the zoosphere is what a naturalist means when he speaks of the

migrations of plants and animals. The superficial impression—which most of us never outlive—of a stable fauna and flora in any region is like a single fitting picture from a cinema film; it is our own snapshot of a single phase in this infinitely tangled process.

The zoosphere, moreover, even when regarded as a whole, is discontinuous here and there, like the watery envelope. Its elements, the various species, in their several **Distribution of living things** distributions are still more discontinuous. Certain Alpine plants and animals, for example, which are identical on the peaks of mountains hundreds of miles apart, are not found in the lowlands between.

In some instances we cannot yet explain how the habitats of some such Alpine species came to be so disconnected as they are. But we are justified in assuming that, if we could look far enough back, we could trace these scattered localities expanding and uniting till they formed a continuous region. Each such distribution represents, of course, the result of a struggle between the innate but changing energies of that particular kind of creature and the combined forces of an environment which has been changing too.

So far as his physical needs are concerned, Man behaves on the surface of the planet exactly like any other animal. He depends for his maintenance, like all other living things, on sun-illuminated soil. All human activities, therefore, are intimately 'controlled' (in the sense in which that word is used by geographers) by the distribution of moisture and solar energy over the land surface—that is to say, by the configuration and composition of the land, and by that atmospheric distribution of warmth and moisture which we describe as climate.

Man differs, however, from the other animals, as they do from the plants, mainly in the extraordinarily wide range and the great rapidity of his locomotion. He was almost as ubiquitous on the earth as the domestic fly, even before he learned to fly himself.

The principal reasons for this great range of locomotion may be easily analysed. In the first place, Man is almost indifferent

to temperature ; not because he is insensible to its effects, but because his reason enables him to protect himself against them by means of clothes and stationary shelters or dwellings, and most of all by his discovery of the making and utility of fire.

Secondly, he is almost indifferent to drought. The bee can store food and even liquid so as to have provision in the event of seasonal changes, but neither a bee nor even an ant can move its commissariat from place to place. The camel, indeed, can traverse a desert, since it carries its water in a pouch in its stomach ; but Man alone among animals has created receptacles for liquids which are both portable and separable from himself.

Thirdly, Man is almost omnivorous, in this respect also resembling his constant companion, the domestic fly. Man can tolerate, if there be need, the most monotonous uniformity of diet, and he can digest a very great variety of vegetable fruits and roots. At the same time, by skill and weapons he can overcome and kill many animals that are at once edible and incapable of being domesticated. He has gained, also, through his discovery of fire and various methods of cooking, the means to render edible and nourishing

many other kinds of food which in their unaltered state are not wholesome.

Fourthly, Man is almost indifferent to obstacles which block the spread of other living things, for such obstacles he can both surmount and remove. This indifference to obstacles he owes mainly to his command of implements for dislodging anything which stands in his way. What is particularly favourable to the expansion of this species is that he can surmount the principal obstacle to all other migrations of living things, an expanse of water, because he can make rafts and boats and drift or propel himself across it.

Prominent among what Aristotle describes as 'implements for living' are his domesticated animals ; and, most important of all, he has acquired to a unique degree the power of utilising as an implement and means for effecting the most varied purposes that most efficient and versatile of domestic animals—that 'living implement'—his fellow man. Man's great gift is imagination, and therewith, on the one hand, an intellect to devise operations which are far beyond his individual capacity to execute, and, on the other, the docility to allow his

energies to be directed by clearer reason and stronger will. These powers have enabled him by organization to produce effects upon his own distribution, and upon the complexion of the planet at large, which are entirely beyond comparison with those which have resulted from the activity of any other animal.

What determines, then, whether this or that geographical region has historical interest ? Whether, that is, within its limits, under its physical conditions and structure and climate, and with the facilities derived from its non-human population of plants and animals, Man has produced any significant change in the nature of the region itself, or achieved any

Latitudes	Temperature	Winds	Rainfall	Vegetation
	North Cold Zone	North Polar Easterlies	Mainly Snow, Fairly Dry	None
60°	North Temperate Belt	Northern Westerlies	North Temperate Rain Belt	Tundra
30°				Coniferous Forest
0°	Hot Belt	Sub-tropical Calms	North Tropical Dry Belt	Desert & Oases
		North-East Trades	Equatorial Rain Belt	Savanna, Parkland & Forest
		Calms (Doldrums)	South Tropical Dry Belt	Equatorial Rain Forest
		South-East Trades	South Temperate Dry Belt	Savanna, Parkland & Forest; Occasional Desert
30°	South Temperate Belt	Sub-tropical Calms	South Tropical Rain Belt	Woodland, Grassland & Prairie
60°	South Cold Zone	Southern Westerlies	Snow, Dry	None
S. 90°		South Polar Easterlies		

EARTH'S CHIEF CLIMATIC BELTS

Diagrammatically shown, these are the belts of climate whose different effects upon mankind we consider in this chapter. The degrees of latitude can only give their average thickness, which naturally varies as each is passing over sea or continent, etc.

contribution to his own make-up of customary behaviour?

The first step towards an answer to this question is to ascertain what the geographical distribution of human achievement actually is; the next, to discover what light this distribution throws on what we might describe as the historical interest of (for example) tropical rainfall or westerly winds, or ruminant animals, or 'blackamoor,' 'redskin' and 'paleface' men. And since what we are actually investigating is the intensity and the issue of Man's conflict with nature, we may reasonably proceed by classifying the principal types of natural regions into a series, starting from the more austere and advancing to those that are more kindly and amenable to Man's attempts to make himself 'at home,' and master of his surroundings.

This series will not be a simple one, for the dominant factors, as we have seen, are various. We must take into account altitude, which depends on terrestrial structure; temperature, which depends mainly on latitude between equator and poles; and water supply, which depends mainly on the shape and size of the land masses and the supply of air-borne moisture to each part of their surface.

Extreme cold—involving as it does immobilisation of water as ice and fallen snow, so that moist winds only make matters worse, from

Man's chief types of Livelihood Man's point of view—makes it impossible to engage in most forms of human activity. At best by constructing shelters in and of the snow, by fishing through gaps in the ice, cooking with blubber and dressing in sealskins, the Eskimo and a few other Arctic peoples maintain themselves precariously and in very small numbers.

Even where there is summer thaw sufficient for a brief growth of Arctic vegetation, the pursuit of migratory animals offers at best a change of prey. Arctic



FIGHTING NATURE IN THE FROZEN NORTH

It is not to the cold zone that we look for human progress. Life among the Arctic peoples—Antarctica is uninhabited—remains a precarious matter, and such methods as fishing through holes in the ice can only support the smallest communities.

utilisation of the reindeer is confined to the northern fringe of the great Old World region of nomad pastoralism; and results from the northward retreat of some of its more primitive inhabitants, long habituated to reindeer economy elsewhere.

To these modes of life the southern hemisphere offers no parallel, for its continuous land masses do not extend into Antarctic latitudes; while the Antarctic continent itself has no indigenous inhabitants. In extreme South America, however, the shore-haunting Yahgans (see page 313) offer the closest living analogy to the mode of life revealed in the 'kitchen-midden' deposits on the coasts of Denmark and Japan—deposits that accumulated when the climate of these countries was still that of the margins of an ice cap, and therefore very like the climate of modern Greenland. It is not in such surroundings as these that we are to look for advancement beyond the very primitive life of this frontier towards No Man's Land.

At the other extreme, in the regions of equatorial heat, it is again not the mere temperature, but the torrential and perennial rainfall which has defeated Man, by nourishing 'rain-forest' vegetation more luxuriant than he had as yet the means to modify. Here, too, the human population is sparse, ill organized even for per-



THE WORLD'S SLUM CHILDREN

Still less than the Arctic regions do we expect the equatorial belt to breed civilizations. These Congo pygmies are fair examples of the type of humanity reared in a rain forest.

Photo, T. Alexander Barns

manent family life, and forced to rely on natural sources of food—fruits, roots and elusive jungle game.

Forethought is almost superfluous, since stored food moulders and weeds grow faster than cuttings; last year's hut is smothered by fresh undergrowth; a duplicate weapon is merely an extra burden. To live at all, Man must live by the day, and actually from hand to mouth. He has little leisure except for sleep, and that is curtailed by the necessity of satisfying his hunger. He does not understand routine, and has little use for tradition, for 'the one thing needful is the one thing uncertain.' When such people meet, if they can understand one another at all, they talk about food, especially game, as we talk about the weather; more usually, they kill at sight, for man is good eating.

These tropical rain forests, wherever they occur, on the Amazon, on the Congo, in Malaya and its island-world, are the slums of the planet; Man subsides into them and, once engulfed, he seldom emerges. When he has become habituated to this feckless, unsocial—but, to the individual,

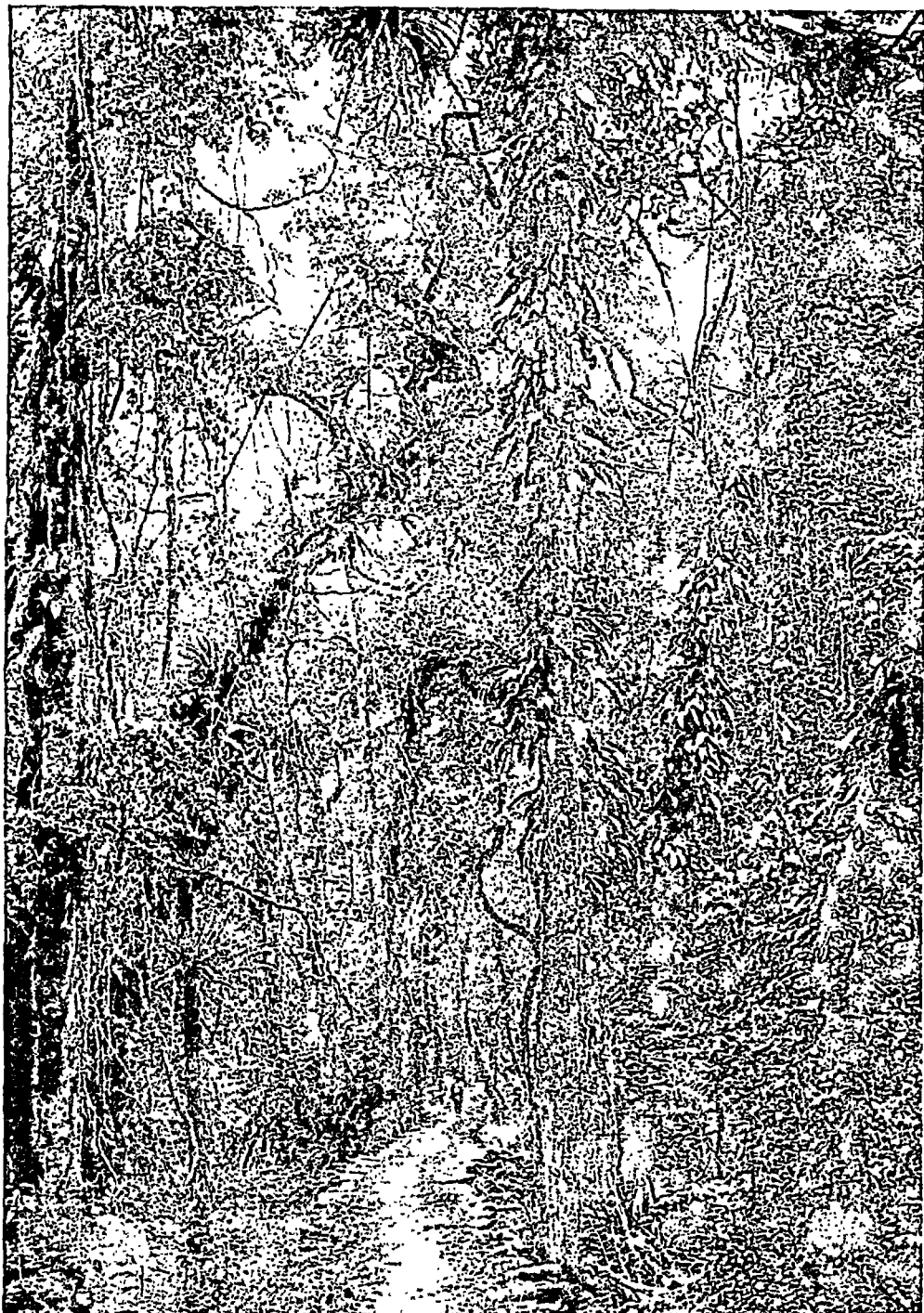
intensely interesting—career, we experience the same difficulty in reconciling him to any other manner of life as we do in the case of our own slum dwellers.

Historically, when such regions have acquired human interest, it has been as sources of some indigenous product, which the natives know how to obtain and someone from outside has discovered how to use: ivory, 'Peruvian bark,' palm oil, rubber; occasionally gold, 'stream-tin,' rubies and other 'pebbles' out of river gravels.

North and south of this equatorial rain-belt lie regions swept by the 'trade winds.' These winds, whose general direction is from cool to warm latitudes, are dry winds; even when they blow on-shore they do not bring much rain. When they traverse large land areas, they diminish vegetation, changing the face of the land first from forest to grassland, and then from grassveldt and steppe to desert. These conditions are most obvious in Australia, South Africa and South America. In the northern hemisphere, the greater size of the land masses accentuates seasonal disturbances, and 'monsoons,' landward in summer, seaward in winter, largely take the place of trade winds.

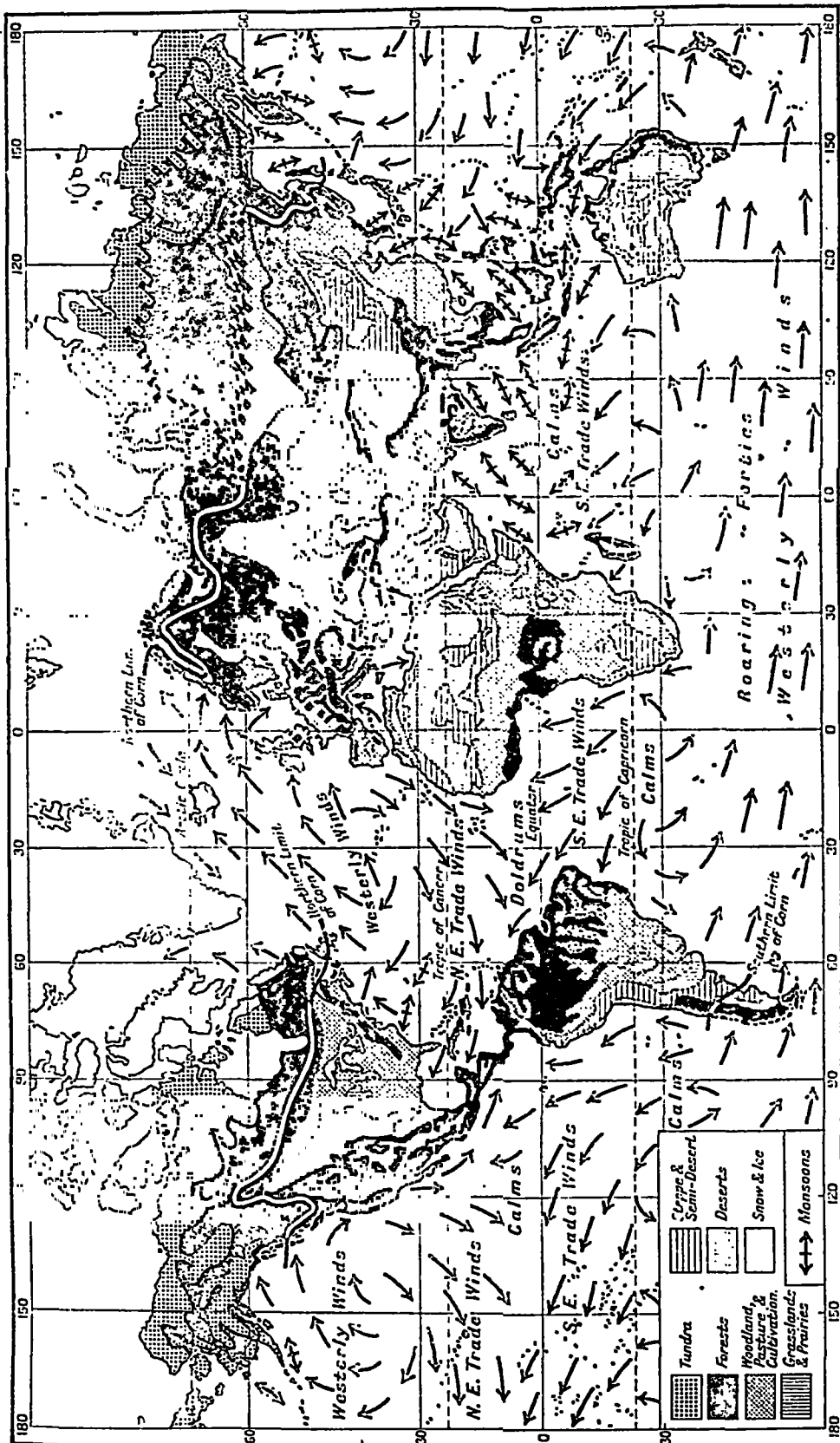
On these grasslands that we find in countries served by the trade winds, and still more in the parkland or 'savanna' country, which consists both of open grass and of dense forest, game is very plentiful, and the individual species of animals are usually large. Hunting in this open country requires organization and leadership as well as individual skill; so that communities are larger, more stable and more closely attached to customary hunting grounds than in rain forests.

Where soil and seasonal rainfall are favourable, wild plants such as manioc and banana are re-bedded into ground from which the natural growth has been removed; and as this sedentary food-quest falls mainly to the women, while the men-folk go hunting, differentiation of employment and interchange of produce leads to more elaborate social structure than is found among the 'low hunters' of the forest regime. Most of these 'high



WHERE MAN STAGNATES: IN A CONGO RAIN FOREST

In the steamy, rain-sodden forests of the equatorial belt, such as this matted corner of Ituri District in the Belgian Congo, Man must live from hand to mouth with no provision for the morrow. Co-operation is unnecessary to secure a livelihood, which nature provides of her own accord, but only just enough to keep body and soul together. Even this trail is due to European interference.



EFFECT OF WIND, RAIN AND TEMPERATURE UPON THE MANTLE OF GROWING THINGS THAT COVERS EARTH'S SURFACE

These are the types of vegetation, also distributed round the globe in belts, that are produced by a combination of the climate and rainfall shown in page 332. It will be observed that another factor with a profound influence on vegetation is the incidence of trade winds and monsoons. The trade winds, which are dry and constant in direction, produce grasslands, or even deserts where large land masses capture what little moisture they bring; whereas the monsoons, which are reversed in summer and winter, bring seasonal rains. The swollen rivers that result build up deltas with a typical fen-flora.

hunters' have some sort of dog; in South America the llama and vicuña have been imperfectly tamed, for their crop of hair and as transport animals; and in parts of Indonesia and the Western Pacific jungle-pigs haunt the villages, and are valued as a reserve of easy game.

The vast continents of the northern hemisphere extend both northward across the whole belt of westerly winds, into the Arctic region with which we began, and also sufficiently far south to replace

the trade winds by the
Monsoon regions seasonal monsoons. The
and their Flora latter are far more important in south-eastern Asia than in North America, where the corresponding region is submerged in the Gulf of Mexico, and only the 'cotton belt' and orange groves of Florida, replacing indigenous garden culture, betray the presence of moist summer winds.

The heavy but seasonal rains of the monsoon-lands falling, especially in Asia and north-eastern Africa, on rugged country, have silted adjacent seas with immense alluvial plains, traversed by the delta streams which have created them. Here are the great 'marsh-margin' civilizations.

The staple food of the people living in these areas is rice, a reclaimed marsh-grass, cultivated laboriously in prepared beds along the rivers of India and China. It is grown less artificially in clearings of tropical forest in Malaya and its island-world; and is also collected wild in certain natural swamps of North America. Here, under the rather less pronouncedly monsoonal conditions, its place as a principal food is taken by another moisture-loving cereal, Indian corn, which is now widely cultivated also in those parts of South Africa which have copious seasonal rains.

For the profound influence of the monsoon regime on human customs and institutions, and also for the very special instance of the Nile, a monsoon-fed river whose lower course traverses the desert belt and whose delta is so far north as to be affected remotely by the westerly winds, reference must be made to Chapter 14.

It is sufficient to note here that with the exploitation of these amazingly prolific marsh cereals, supplemented by tamed

fen-side animals, such as the pig and the buffalo, it is possible to maintain in the monsoon-lands a dense rural population. The inhabitants must, however, devote their lives to the arduous and unending labour of producing this highly special food, and providing, locally or in exchange for surplus rice, the savoury condiments, dried fruits, spices, curries, sugar and (above all) tea, without which perennial rice-pudding fails to please.

In the Old World the monsoon-lands of Asia and the African savanna, where other subtropical cereals are cultivated, are bounded on the north and north-west by a broad belt of desert, from Morocco to Mongolia. This is only passable at either end, or by narrow corridors such as the valleys of Nile and Euphrates, or the precarious caravan routes from oasis to oasis across the Sahara, Arabia and Turkistan.

In North America the greater part of the corresponding region is covered by the Gulf of Mexico, but similar desert lands which we find, for example, in southern California, Arizona and northern Mexico have produced similar historical effects, in shielding the fertility of Central America from the aggressions of hunting peoples on the grasslands beyond. For we are now approaching in our survey the region out of which proceed the great pulsations of human initiative, the northern belt of westerly winds with intermittent rainfall at all seasons of the year.

This zone varies in width and in its degree of latitude, being restricted and displaced northwards over the two great continental areas by the same local forest and shrubs disturbances as cause the trade winds to be superseded by monsoons. Only over the North Atlantic and North Pacific do the westerly winds attain volume and force at all comparable with those of the more landless southern hemisphere. The fickle weather and intermittent rains for which the British Isles are proverbial are typical of the climate of this zone.

Till Man intervenes, the characteristic vegetation is fairly dense forest, the trees of which shed their leaves in the winter; about them grow rich thickets of shrubs and herbage, of which our hedge-rows are

examples. This type of vegetation gives place northwards to evergreen pines and firs, with little or no undergrowth; while southwards, towards the desert belt, other evergreens, such as holm-oak and laurel, replace deciduous trees, and leathery, aromatic shrubs the lush undergrowth. Everywhere the poorer and more porous soils sustain only a shallow but compact carpet of heather-moor and peat-moss in the north, of turf in limestone regions and of coarser grass, or esparto, on the steppes which fringe the great desert zone.

The width of the forest belt from north to south is fairly uniform, though parts of it, such as Hudson's Bay, the North Sea and Baltic, the Mediterranean and the Sea of Japan, are submerged. On the other hand, the grasslands along its southern limit vary greatly in extent, disappearing altogether between the Alleghanies and the Atlantic, but covering immense regions in the form of the American prairies and the steppes of South Russia and Turkistan. Here their continuous width would be even greater were it not that a broad belt of highland, better watered than they, and therefore forest-clad, intersects them, from the Carpathians to the Hindu Kush, separating the grasslands of Asia Minor, Syria and North Persia from the continuous Eurasian steppes, except at the great avenue from Merv to Meshed by which steppe folk reach the Persian plateau.

As an abode of Man, coniferous forest only differs from the more or less frozen lands of the Arctic region in the comparative abundance of game (and also of Man's hunter-rival, the wolf) and of fruiting shrubs. Even the deciduous forest, with its glades of greensward, seems to have maintained only hunting tribes, in both hemispheres alike, until it was colonised by aggressive newcomers from its parkland margin and from the steppes beyond. For the great motive power which has made Man's occupancy the profound crisis in Earth's history that it has been, we have to look to the temperate grasslands of the desert-fringe north and south of the Old-World mountain zone.

To this cradle of human aggression the New World offers no parallel, for two prin-

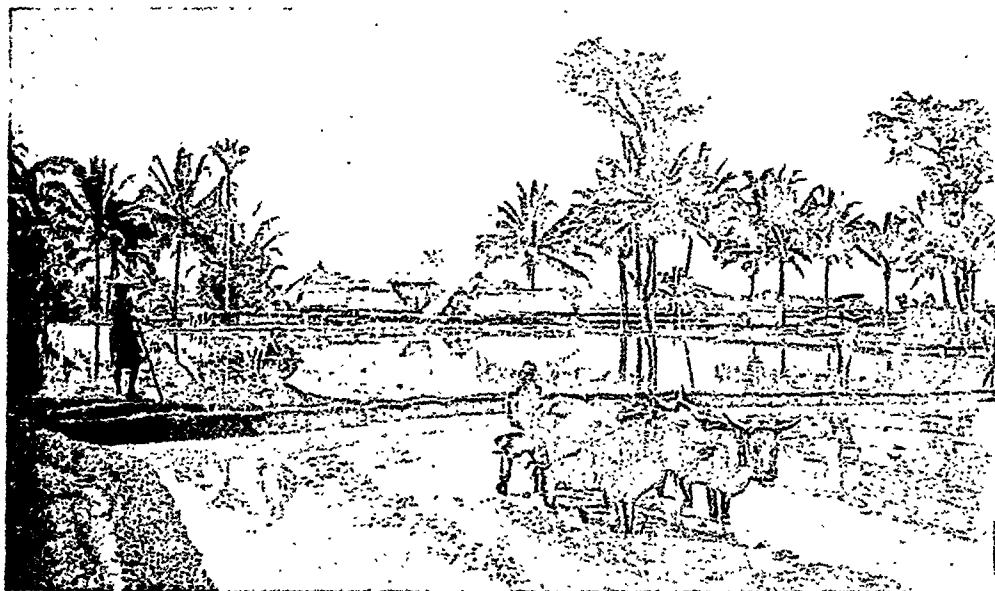
cipal reasons. In the first place, its prairie, though naturally richer in its own horned cattle, the American bison, than the Eurasian steppe, had no counterpart to the Old-World horse. The prairie, too, is not intersected by transverse highlands, but stretches north and south, so that the spring and autumn grazing grounds of the bison lay very far apart. In consequence, this creature acquired a rapidity of movement which would in any case have made it much more difficult for men unprovided with horses to tend their herds, than it was with the leisurely Old-World oxen, even had it been possible to domesticate bison in the first instance.

In the second place, all that we know of the spread of existing races of 'redskins' suggests that they entered the continent from the north-west, and therefore reached the prairie only after long experience of hunting. When, therefore, they encountered the bison they looked upon them as a lordly variety of game, not as a source of milk, cow-hair or power. Even when they acquired the horse long afterwards from European visitors, the sole use they made of it was to chase and destroy the bison more extravagantly, not to round him up for domestication.

Very different has been the course of events in the grasslands of the Old World. From his physical build, and especially from his efficient hand-grip and his soft feet, Foodless Man meets it seems clear that with calfless Cow Man's earliest home

was forest or parkland. How the first men managed to stray thence to grassland, where there is neither edible fruit nor tall cover for so erect a hunter, and where because of this absence of places of concealment the steppe animals are either swift or well defended with horns and hoofs, it is not easy to discover. Probably some chance encounter between foodless man and calfless animal led to the discovery of 'milk from the cow'; some sudden scare at milking time, to the discovery that there was safety on horseback.

Certain it is, at all events, that the northern steppe has been occupied, as far back as its population can be traced, by communities entirely dependent for maintenance on herds of horses or oxen, or both.



LIFE IN THE MONSOON-LANDS : PLOUGHING A JAVA RICE-FIELD

When man turns to agriculture in the moist monsoon-lands, the cereal on which he must rely is the marsh-grass, rice. As in other agricultural districts, this enables a dense population to support itself; but the never-ending toil demanded by rice growing precludes the working out of an elaborate civilization. Contrast the cultures of those peoples who grow wheat or millet.

Photo, G. P. Lewis



GRASSLAND AND SAVANNA : ENTERING THE REGION OF THE TRADES .

Where the trade winds blow, north and south of the equatorial belt, the forest, for lack of rain, dwindles, thins out and finally vanishes. There is a fringe of game-haunted parkland—the typical 'savanna' country—and then rolling seas of grass with scattered clumps of trees near water-courses. These bearers on the southern borders of Brazil have just emerged from the parkland. Beyond the desert, which usually supervenes, grassland recommences under the influence of the westerlies.

These animals have become amenable to human guidance, and thrive under the protection which the horseman's organized rapidity of movement gives. On the fertile margin of the Arabian desert, south of the mountain zone, and perhaps also in North Africa, similar societies are found in very early times, with independently domesticated horses in Barbary, but depending rather on sheep and goats than on large cattle.

Domestic animals furnished Man with a secure alternative to meat obtained by hunting, added milk and its derivatives

to his dietary, and provided in addition abundant leather, horse-hair, wool, horn, bone and other useful materials. They greatly increased the rapidity of locomotion for flight and for attack and the area that could be traversed by Man. Eventually they furnished a new source of power for breaking up the soil, raising water, transporting produce and other laborious tasks.

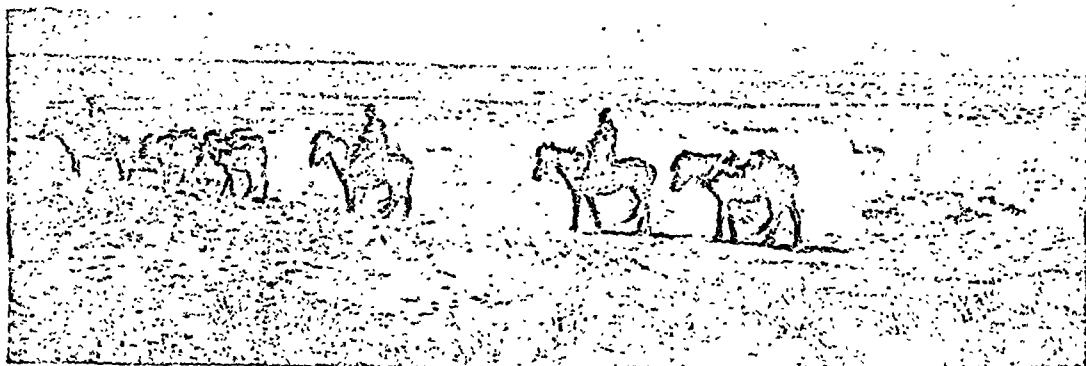
For the social consequences of this economic discovery, reference should be made to Chapters 5 and 14. We may note, however, first, that all pastoral peoples exhibit a peculiarly close-knit and stable type of social unit, the 'patriarchal family,' controlled almost as absolutely as its own flocks and herds by its eldest

male member. It is capable of as rapid multiplication as is its peculiar means of subsistence, namely its animal property, without losing cohesion so long as these animals do not themselves become too numerous for the pasture within reach.

It has this important quality, secondly, that when that pasture fails, as occasionally happens through drought, the mobility of the whole group, men and animals alike, makes it easy to migrate to new grazing grounds, provided only that no larger and stronger group is already installed there.

In the third place, when such migratory pastorals are attracted or driven beyond the limits of the grasslands where they originate and are at home, and overrun parkland or irrigated riversides where agriculture is practised, their habitual view of all green herbage as proper food for their animals leads to perennial feud with the farmers. In such contests, the pastoral people, with their superior mobility, are usually the victors.

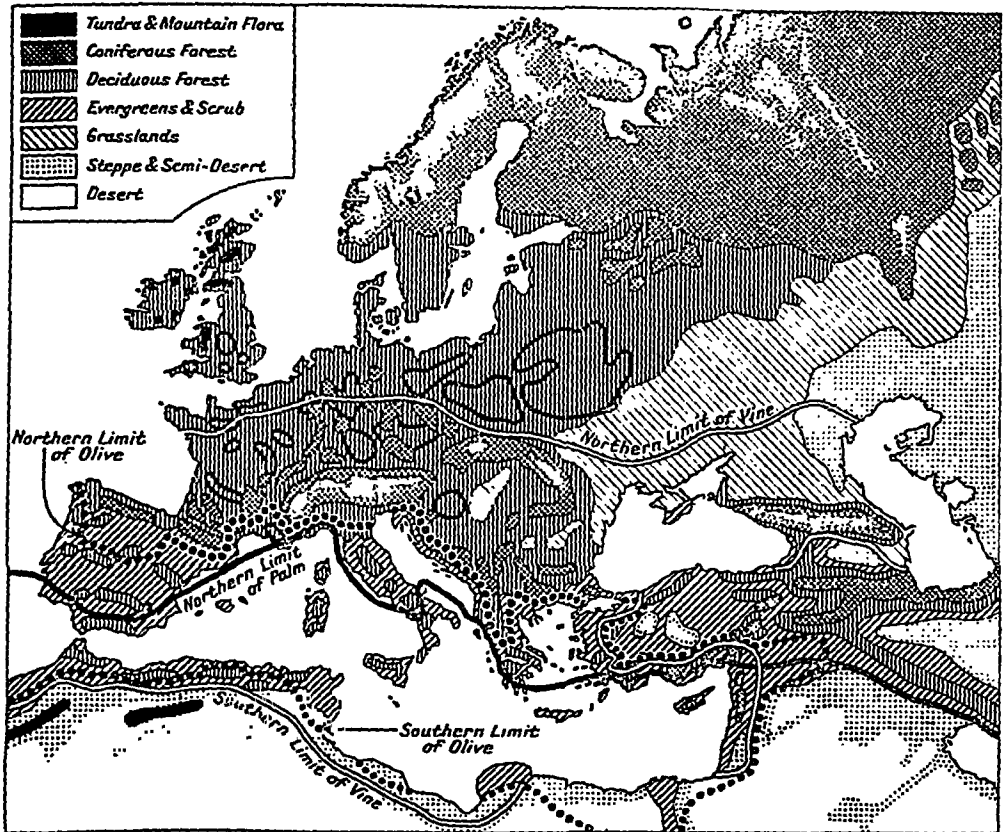
Here we are, for the first time, confronted with the phenomena of conquest and exploitation; of Man's domestication, that is, of that most potent and adaptable implement, his fellow man. Hunting peoples have been known to raid their neighbours' hunting grounds, in times of scarcity, and even to treat alien men as



WHITHER THE WATER COMETH NOT : PART OF EARTH'S DESERT BELT

Right across the world from Mexico to Mongolia, the region of monsoon-lands and savanna is bounded towards the north by a belt of desert, varying in width and intensity, where the rainfall does not average above ten inches annually. This photograph of the typical kind of landscape that results was taken at the eastern end of the belt, looking towards the Altai Mountains.

-Photo, D. Carruthers



EUROPE'S NATURAL VEGETATION AND HOW MAN HAS MODIFIED IT

As this map shows, the natural vegetation of most of Europe was dense deciduous forest of oak and ash and beech. Man's activities, however, have modified the face of the land; to-day only in those areas shown ringed does the primeval forest persist to any extent, and even there it is riddled with clearings. The coniferous patches have mostly survived; elsewhere there are tillage and pasture.

fair game for purposes of food. Cultivators, similarly, eject hunters from their haunts, clear forests and destroy game animals for the sake of agriculture. But in these aggressions the victims, simply displaced, are of no further importance.

Pastoral aggressors, on the other hand, though they may do severe damage to their victims and grievously derange their system of cultivation, seem commonly to regard the sedentary cultivator and all his works as a superior sort of cattle and pasture. They exploit the farmers accordingly, while tolerating their existence, as 'hewers of wood and drawers of water,' and above all, as growers of crops, for the convenience, and under the patronage, of their masters.

In the Nearer East, and around the Mediterranean lake region, yet one more

distinct type of climate and environment remains to be described, the interaction of which with the traditional behaviour of immigrants from the grasslands on either flank of this area has been followed by the most momentous revolution of all—that of prescribing Man's fundamental relation to Mother Earth.

More constant in temperature than the surrounding land, the lake-basins of the Mediterranean serve as a reservoir of warmth far on into the winter, while they retard and moderate the rising heat of summer. The local swirls of moisture-laden air rising from their surface reinforce and extend the winter rainfall of the North Atlantic 'westerlies,' and confine the trade winds to the four or five months when the upward draught of heated air is strongest over the sun-roasted deserts

of Arabia and the Sahara. The result is a very exceptional type of climate, to which parallels are only to be found in a few remote regions, such as California, Natal and south-eastern Australia, and nowhere over so large and coherent an area as this lake region.

Of this typically Mediterranean climate the annual cycle is as follows: the 'turn of the year,' when all growth starts anew, comes after the hot, dry summer, with the first autumn rains; broken weather, with alternate storms and bright, crisp sunshine, continues till April; then, as the sun gains power, the showers become rarer, and end in May or early June.

Brilliant spring flowers are followed by ripening and drying of grasses and all annual foliage; but the characteristic evergreens, bay, myrtle, olive, rosemary and the like, withstand the summer heat. Other deep-rooted trees and shrubs, such as the plane, mulberry, fig and vine, draw moisture from below. Perennial streams are rare; but deep-seated springs irrigate naturally their immediate neighbourhood, and permit gourds and other marsh-

margin plants to mature, after other annuals have become 'dust before the wind.'

As the mountain zone already mentioned traverses obliquely the whole length of this lake region—north of the two Mediterranean basins, south of the Black Sea and Caspian, itself interpenetrated by the Adriatic and the Greek Archipelago—the southern fringes of the deciduous forests of oak, chestnut and walnut which clothe its slopes often come down within sight of the shores. The mountains are frequently high enough to bring even coniferous timber within easy reach of Mediterranean ship-builders.

Minutely sub-divided by rugged foothills, and prolonged into chains of islands off their promontories, these Mediterranean coasts offer many small secluded patches of cultivable land. The same kind of oasis, amid a wilderness of rock and forest, is repeatedly found at higher levels and greater distances from the sea frontage, especially along the outer ranges of the same mountain zone farther east, where its ridges look down



MOST FAVOURED REGION ON EARTH: MEDITERRANEAN LANDSCAPE AT MENTONE

The type of climate most momentous in the history of Man's development occurs as an isolated variation of the temperate belt. It is known as the Mediterranean, and owes most of its peculiarities to the presence of that inland sea. Nowhere else is the natural diet so varied—bread and wine, fruits and vegetables, olive oil, milk and cheese, with sufficient meat to avoid any chance of monotony.

southward over the 'Fertile Crescent' bordering the Arabian flat-land, and northward over the Eurasian steppes.

Conspicuous among the natural vegetation of this Mediterranean region are the wild ancestors of fruit-bearing trees and shrubs, which have been improved by long cultivation and form essential elements in the food supply of all its peoples. Most of our cultivated fruits and nuts, from apples and plums, chestnuts and walnuts, to peaches and almonds, belong to the southern

Mediterranean : fringe of the deciduous
Corn, Wine & Oil forest. The olive and fig are as characteristic of the leathery-leaved class of shrubs as the evergreen orange and lemon which were originally introduced into Europe from a region of similar climate in south-eastern Asia, and which are now among the principal sources of Mediterranean prosperity. The vine has exceptionally nutritious fruit which yields also in the height of summer an agreeable and invigorating drink which will keep. Peas, beans and lentils, too, are patiently selected varieties of the spring-flowering annuals.

Of greater importance was the discovery, in prehistoric times, that a few of the nobler grasses of the Fertile Crescent yielded grains which, when bruised and sodden, were edible for Man as well as for animals. It was found, too, that under cultivation these grasses threw occasional 'sports' which were conserved to become our wheat, barley, oats and other grain crops, just as the 'Indian corn' of the New World came from the wild maize of Mexico. These Mediterranean grains provided a fresh source of most invigorating nourishment for what early Greek poets describe as 'meal-eating' men, which has had a more profound influence on the whole course of history even than the discovery of rice on the special marsh-margin civilizations of the monsoon-lands.

This is principally due to the fact that the cultivation of rice has always involved unremitting attention during the whole lifetime of the plant, and has left the rice-eating peoples so small a balance of strength, initiative and, above all, leisure for anything else but meditation over their

destiny, thus restricted. The production of dry-grass crops, on the other hand, though arduous at the short seasons of ploughing and reaping, leaves long periods of the year free for raising other crops, such as the spring vegetables and autumn fruits already mentioned. The dry-grass cultivators have time also to engage in auxiliary enterprises such as cattle keeping, hunting, fishing and travel in search of foreign commodities.

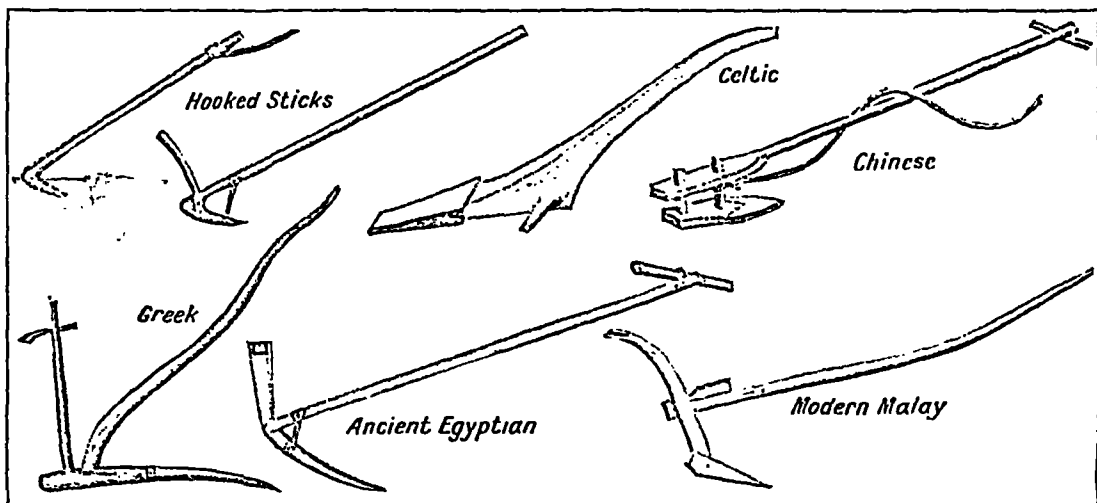
Moreover, the deep stirring of the soil which is necessary for the cultivated grain crops has been immensely assisted by the invention of a 'super-hoe,' the plough. This was not wielded intermittently by the cultivator himself—as in garden spade-work, or the primitive hoe culture of tropical Africa, aboriginal America and neolithic Europe—but was dragged through the field continuously by trained oxen or horses. While thus reducing the labour, this invention of the plough both greatly increased the yield and, by economising time, extended the area which a single family could farm. It had also profound social consequences, especially in regard to the relations between man's and woman's work, and their respective value.

Thus, to the nomad pastoral from the Arabian grassland, the 'good land this side Jordan,' within reach of the winter rain spates and beneficent—because mitigated—sunshine of the Mediterranean coast regime, was not only a 'land of milk and honey' (for there were flowers for the bees, as well as lush grass for the cattle), but, above all, a land of 'corn, wine and oil.' No wonder that, with these gifts of domesticated nature to conserve and The Good Land the nomad pastorals ever this side Jordan ready to 'go in and possess it,' this favoured region became also a 'land of fenced cities' to which the sedentary farmers of the countryside could retire when trouble and Beduins came, and out of which they could sally, to complete the demoralisation into which unaccustomed plenty was only too certain to plunge the intruders.

It was in this exceptional regime of lake-land configuration and Mediterranean climate and vegetation, where forest-bred men of the mountain zone—whose

aboriginal habits we can at present only reconstruct from hints about 'acorn-eaters' in Greek folk memory, and from survivals such as our Christmas chestnut roasting and children's game of gathering 'nuts in May'—were in juxtaposition with the grain cultivators of the Fertile Crescent and the grassland herdsmen of Arabia and of the Eurasian steppe, that the composite mode of life originated, which has been curtly described as the 'bread and wine'

accessories of the grain diet to appreciate the nature of these modifications. Beyond the restricted range of olive cultivation, oil is replaced by butter, as butter in due course is replaced by blubber beyond the range of grazing animals. Wine and grape spirit are succeeded, where the vine ceases to flourish, by cider and cherry brandy; and these in turn, beyond the latitudes where fruit fully ripens, by beer, gin, whisky and vodka, prepared from fer-



HOW THE PRIMITIVE HOE HAS EVOLVED INTO A PLOUGH

Primitive cultivators had to hoe their fields by hand, and the invention of that 'super-hoe,' the plough drawn by animals, was an immense advance in civilization. Save the last, these are early ploughs drawn from the monuments or reconstructed from actual remains. The first two are little more than hoes dragged through the ground. The Malayan is akin to the modern Arab form.

culture. But it includes also, as essential elements, olive oil and milk products such as cheese and the like.

In the strength given by this powerful combination of primary foods, itself maintained by the combination of the herdsman's organized initiative with the gardener's seasonal round of foresight and industry, there grew up three of the great civilizations enumerated in Chapter 14—and those the most important. The outcome of this culture is the civilization, still incomplete, which our immediate ancestors have transmitted to the grasslands and forest margins of the New World, and of the Southern Hemisphere.

Naturally, as it spread over regions of different geographical quality, the civilization of the wheat growers has had to adapt itself to its surroundings. It is only necessary, as in the monsoon-lands, to look at the principal condiments and

mented grain, which have superseded their ancient rival in the forest economy, the mead fermented from honey.

But these are matters of detail, only cited here in illustration of the same regional limitation on human ingenuity and initiative with which we began. What remains constant and characteristic is that main course of human advancement which, first becoming apparent in Egypt and Babylonia, finds its supreme intellectual and aesthetic expression in the sea-borne culture of a Mediterranean world that we associate with Greece. It reaches the maturity with which we are familiar, in its later exponents, among the stripped forest-lands of western and central Europe, and their oversea settlements in turn. This main sequence of progress remains, as it began, dependent on a particular and highly specialised combination of elementary food quests,

only found indigenous within a single coherent region of well defined geographical circumstances, and only practicable in regions having similar characteristics.

When we speak of the culture of Europe or of the 'Western World,' we mean, geographically speaking, the culture of the wheat growing, cheese making, beef eating section of mankind; just as when we speak, by contrast, of the Far East, we mean the cultures of the monsoon-lands and their rice eaters. When, similarly, we distinguish the Nearer East, as a special type of civilization, from the Mediterranean and European West, we mean those parts of the ancient bread-oil-and-wine culture which have been overrun and exploited since the Christian era by one sort or another of intrusive predatory pastoralists—Saracen or Mongol. For with these invaders the sedentary cultivators and industrials of the invaded regions have not yet settled their account.

We have thus seen that all the varied forms of human activity—and, we may now add, the geographical distribution of each of them—are consequences of the two fundamental activities of Man. One is concerned, as in the case of other animals, simply with attempt to preserve life in the midst of nature; the other, the specifically human endeavour to improve that life in one way or another, so that it may be, however slightly, in advance of that stage at which it stood before.

This twofold struggle to maintain life and to ameliorate conditions takes a specific form and direction in each region of the Earth. But the

The problem precise form that it assumes is not the result of human reason unaided and uncontrolled; it is closely dependent on the quality and degree of the many forces of nature, on the external non-human circumstances of fauna and flora, climate and surface relief.

Hitherto we have been dealing mainly with geographical regions, climatic regimes and the distribution of human activities in conformity with them as if the various factors persisted without significant change. But though this was necessary, to present the geographical facts most simply and clearly, it was noted

at the outset, and is obvious, that all these kinds of circumstances are themselves in process of adjustment; and that, as they change, they bring about other changes and accommodations.

Something of this kind, for example, probably accounts for the commencement of Aryan intrusion from the Eurasian grassland into India and Iran; and again for the westward outpouring of Mongol nomads from the high plateaux of Central Asia through the Zungarian corridor into Turkistan, and also for their first eastward move into northern China. Thus historical processes which at first sight seem to be recurrent, may sometimes be shown to have had a definite beginning as well as a definite cause. They may also come to an end, as the regime of the palaeolithic hunters was extinguished when the deciduous forest encroached upon their open hunting grounds, offering cover and maintenance at the same time to a new human population habituated to life among trees.

Effects of
climatic change

The further question, what different kinds of man are involved in a revolutionary change of this kind, concerns the anthropologist rather than the geographer. It is, however, already clear (as more precise observations are accumulated) that the various breeds vary greatly in their ability to maintain themselves, either as individuals or by rearing healthy offspring, in this or that kind of climate and surroundings.

In the Mediterranean region, for example, which is not in a general way unhealthy, long continued immigration of various alien stocks has produced remarkably little change in the physical types of its population. The foreign strains, whether they interbreed with those whom they find there or not, gradually disappear, or at most affect only indirectly the predominant types which survive. In more austere, more highly specialised climates, the failure of newcomers to acclimatise their physical type is notorious.

More obvious, though not for that reason necessarily better understood, is the fact that Man's initiative, exerted however unconsciously, produces large

and often quite unforeseen effects on his surroundings, as well as on his own range and behaviour; by derangement of the geographical distributions which he encounters. A conspicuous instance is his domestication, so to speak, of fire, enabling him to maintain himself in climates more rigorous than his physique can tolerate unaided, but only at the cost of wholesale destruction of forest for fuel. This is an incentive to clear forest far more potent, though less generally recognized, than the necessities of agriculture, and is responsible in the Mediterranean lands, and also in some parts of China, for the exposure of far more soil to irremediable devastation by mere rain-wash (from which forest foliage normally screens it) than was ever added by forest-clearing to the cultivated area.

Another is the domestication of water, and its redistribution in artificial channels over land fertile enough for agricultural purposes when moisture is thus supplied, but barren otherwise; as in Egypt, Mesopotamia and (of late years) Australia and northern India. Most far-reaching of all, in its effects on redistribution, is that other use of water, the principal natural obstacle to the spread of all land animals, as an almost frictionless agency for transport, and the conversion of dead and rotting tree trunks into the 'dug-out' canoe and first raft for navigation.

Few things, indeed, are so characteristic of Man's dealings with nature as his knack of finding for her wastage secondary uses of his own. Once

Man's power over Environment made a servant of Man, like the rivers, the sea serves to abridge distances, and permits readjustment of neighbourhood to an extent which it is difficult to represent on a map. The distortion evident in many ancient maps, indeed, expressed this fact of relative accessibility often more eloquently than our careful surveys.

Once in possession of docile animals, swift or hardy, Man has been enabled, as we have seen from the behaviour of nomad peoples, to redistribute himself over land areas. He was, however, subject to the

restraint of insurmountable or impene- trable barriers such as mountain and forest. In command of sea transport, he has transferred not only himself but his livestock and seed-corn to those other regions of similar geographical quality where these resources were lacking. Domesticated cattle have been shipped to North America to replace the native bison, and both cattle and grain-crops to the temperate lands of the southern hemisphere.

The objection is sometimes raised to the geographical interpretation of historical occurrences, that it assigns preponderant or at any rate undue, importance to the physical Environment and factors in the problem of freedom of Will and ignores the 'freedom of the will' in which historians and ever philosophers appear to find the chief cause of 'what actually happens.' Such objections suggest that the critic has not clearly understood that, for the geographer, human wills, however potentially 'free,' have a distribution and frequency over the Earth's surface just as ascertainable as those of any plant or other natural phenomenon; and that, like sunlight, rainfall and vegetation, the intensity and potency of these 'free' wills varies, even while their scope is unmodified.

The occurrence of an Alexander or a Napoleon is no less a geographical fact than the occurrence of the first domesticated horse or dog, or the San Francisco earthquake, or the cutting of the Suez Canal. Each has its own range of effects in space, and its interactions with other occurrences, until some obstacle to its activity is reached. Historian and geographer, that is, contemplate the same universe of events from distinct but inseparable points of view, and ask correlated questions. What the historian seeks to ascertain is: 'What happened then, and why?' The geographer similarly asks: 'What happens (or happened) here (or there), and why?' And it is the function, finally, of Historical Geography—or is it Geographical History?—to discover why what happened just then happened also just there.

THE IDEA OF THE SUPERNATURAL IN HUMAN DEVELOPMENT

An Evaluation of the immense Part played in History
by Man's Irrational Beliefs about the Unseen World

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THE man who prides himself on his freedom from superstition and, oblivious of the extent to which his own actions are determined by tradition and emotion, imagines that his thoughts and behaviour are wholly rational, may perhaps ask whether supernatural ideas have exerted any significant influence on the history of civilization.

The question, however, which the student of human nature has to answer is not whether such ideas have played any part in human progress so much as whether any other factor can be compared with the idea of the supernatural in the vastness of its influence upon Man's conduct and beliefs throughout the ages.

Before undertaking a journey in order to make peace with another tribe, the Ibans and Kenyahs of Borneo perform an elaborate ritual for the purpose of discovering, from the flight of any hawks that may appear, whether the time and the occasion are propitious for the enterprise. The Divine Hawk is also consulted before sowing and harvesting the rice crop. Another method of divination popular in modern Borneo is, like the examples just mentioned, reminiscent of the customs of the ancient Etruscans and Babylonians. This consists in the inspection of the liver of a sacrificial animal; and from its anatomical pattern omens are read.

It could be shown that in every phase of the daily life of the present inhabitants of the Malay Archipelago their behaviour is wholly dominated and shaped by such supernatural beliefs, which they do not pretend to understand or explain.

It is enough for them that there is a tradition, handed down to them from their ancestors, that they should perform certain strange rites and observe certain ceremonies which to us seem wholly unreasonable and beyond the scope of any natural law.

They also believe in supernatural beings who are supposed to appear in the form of crocodiles, and to control the health and prosperity of each individual and confer fertility upon his rice fields. On settling in a new district, Dr. Charles Hose tells us, the Iban people always make a life-sized image of a crocodile or crocodile-like dragon, which is set up on a standard in the field selected for the planting of rice. Food and clothing and the blood of sacrificial fowls and pigs are offered to this image, which thus propitiated is believed not only to confer good crops, but also to destroy all rice-eating pests:

This crocodile (or dragon) is regarded as a relative, usually an ancestor, who is able to grant these boons by reason of supernatural powers acquired after death. Similar standards are set up to heal the sick and to bring good fortune to men on the war-path. The crocodile is in fact the symbol of all those supernatural powers that control Man's destiny.

Crocodiles and
the Supernatural

It may be argued that these ideas are merely the superstitions of relatively uncultured people and have no relationship to the conduct and beliefs of more civilized peoples. But the practices now surviving among the people of Borneo can be traced back in some cases for more than fifty centuries of Man's history

and can be shown to have been very widely observed.

In particular the ancient people of Italy, from whom so great a part of European culture has been derived, are known to have entertained similar supernatural ideas, the survival of which in Borneo has been so clearly shown by Dr. Hose. When we speak of the sanctity of the flag we usually mean to imply nothing more than the symbol of our nationality, which all loyal citizens revere; but there is little doubt that the flag is a much modified descendant of the ritual standard of ancient times (which, as we have seen, still survives in its original form in Borneo) and was regarded as the animate form of the protecting deity able to confer health, safety and prosperity.

I have referred to Borneo in order to give a concrete illustration of the completeness of the belief in the supernatural control of mundane affairs that once was not the exception but the general rule. Even to-day the vast majority of mankind is still under the sway of these ideas.



BORNEAN SEER READS THE OMENS

Divination from the livers of sacrificed animals is practised by the Kayans. The anatomical markings of each liver are studied—this soothsayer carefully traces them with his forefinger—and in them are discovered signs for the future.

Photo, Dr. Charles Hose



WHERE HAWKS ARE AUSPICIOUS

Auguries are sought in the flight of hawks by the Kenyahs and Kayans of Borneo. Here we see a figure of the Divine Hawk surmounting a tall pole; and, beyond, the elevated building from which the flights of hawks are observed.

Photo, Dr. Charles Hose

Nor is it only the relatively uncultured people who are affected by them. Some supernatural element represents the essential kernel of belief in all religions, but quite apart from this, many superstitions that are alien to the higher religions are widespread amongst people who have the amplest opportunities for education and the acquirement of culture.

The use of mascots and amulets, the resort to palmistry and crystal gazing, are only a few examples indicative of the thousand and one forms of divination and necromancy that survive amongst the upper classes of society to-day. Amongst the peasantry much of the ancient lore concerning supernatural forces, such as the influence of stone axes, or 'thunder-stones' (see page 146), as protections for dairies, or the magical properties of the mandrake, is still believed and confidently put into practice. But it is not necessary to hunt out these more eccentric



BABYLONIAN DIVINER'S CHART

The ancient Babylonians also believed that omens were to be found in the liver. On this clay model from Mesopotamia holes and lines mark significant parts of a sheep's liver, and a key to their meaning is given in cuneiform writing.

From the British Museum

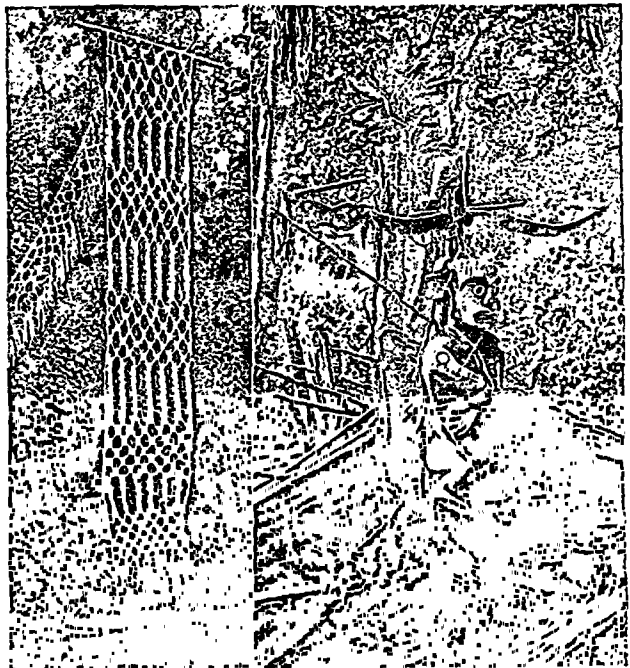
expressions of universal superstitions. Though Man is often assumed to be a rational creature his actions are rarely determined by reason. Tradition and emotion are responsible for most of his thoughts and actions, and reason comes into play to explain behaviour which is usually inspired by altogether different motives.

Only a few centuries ago the most learned men were seeking for elixirs of life and the philosopher's stone that would transmute base metals into immortal gold. Such pursuits were merely the concrete expressions of a hope that is as old as Man himself. The instinct of self-preservation inclines men to clutch at any straw that seems to provide a support, however slender it may be, to the hope of evading the risks of death and consequent extinction. Alchemy and astrology and many other systems of magic that promised to reveal Man's destiny, and

offered the means of safeguarding his life, have now fallen into disrepute.

But if it is true that relatively few people who have come under the influence of Western European rationalism now take such superstitions seriously, many other sublimations of essentially the same ideas are still widely prevalent. If we do not now trust omens to foretell what is going to happen in the future, nor read auguries and divination in the flight of birds or the livers of pigs, our behaviour is still affected by all sorts of trivial events and circumstances that are equally lacking in reasonable justification but are confidently believed to presage good or evil.

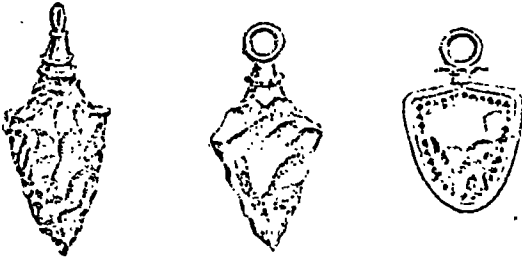
Most people beyond the pale of European civilization believe the world around them to be peopled by invisible spirits who are working for or against their welfare. These faiths give expression to the direct influence of supernatural ideas. But the indirect effects of such beliefs in the past are expressed in the form and texture



IDEAS OF THE SUPERNATURAL IN BORNEO

The Ibans and Klemantans of Borneo body forth their ideas of the supernatural in the shape of crocodiles, set up in new rice-fields or before the doors of houses. On the left the crocodile may be seen at the foot of a woven 'altar cloth' on the right, fixed to a pole above the head of the wooden image.

Photo, Dr. Charles Hoss



STONE WEAPONS WORN AS AMULETS

One of the longest-lived superstitions is that which credits Stone Age weapons (under the name of 'thunderbolts'—see page 146) with magical properties. These flint arrow-heads were worn as charms as late as the eighteenth century.

of the civilization to which we are all subject to-day. Practically all the institutions and conventions to which our lives have to conform, even many of the most prosaic and apparently utilitarian practices, are the results of beliefs involving the idea of the supernatural.

Out of the supernatural beliefs of the astrologer and the alchemist the sciences

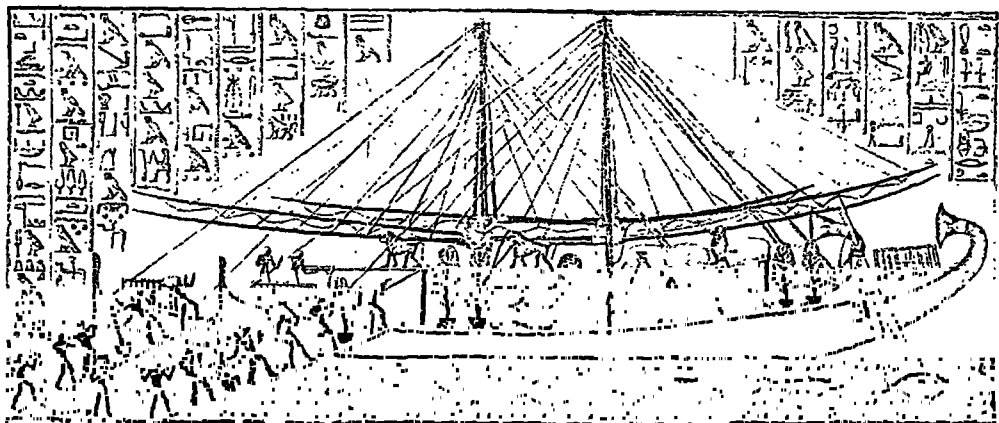
of astronomy and chemistry developed. In fact it can be shown that the severely rational discipline of the modern developments of science is to a great degree the outcome of the inquiries of the medieval magicians.

The crafts of the carpenter and stonemason were originally elaborated to protect the bodies of the dead, under the belief, which we now know to be devoid of any reasonable justification, that such measures for the safeguarding of the corpse could prolong the man's existence. The same train of supernatural ideas found expression in the invention of the arts of embalming, the making of portrait statues and architecture. The preservation of the body, the making of a life-like image of it, and the erection of buildings to protect it and afford facilities for the ceremonies of animating and nourishing the dead, were the motives that inspired these varied arts. Even an incentive to



THE SEED FROM WHICH MODERN SCIENCE GERMINATED

If to-day we realize that alchemy—the baseless search for the Philosopher's Stone and the Elixir of Life—was grounded in an immemorial reverence for gold, and has its justification in the modern chemistry to which it gave rise, other ages were not so impartial. It either commanded the blindest credence, or else was subjected to the ridicule that informs this sixteenth century engraving from the painting by Pieter Brueghel. In the panel we see the alchemist admitted to the workhouse!



SHIPS THAT QUESTED FRAGRANT CARGOES FOR THE TEMPLE OF AMMON

Sea voyages to Punt (modern Somaliland and Southern Arabia) were undertaken by the ancient Egyptians primarily to obtain commodities that served some ritual purpose. Thus, these two ships belonged to the fleet of five sent to Punt by Queen Hatshepsut of the Eighteenth Dynasty to obtain rare and fragrant woods, resins, balms and other offerings for her temple at Deir el-Bahri.

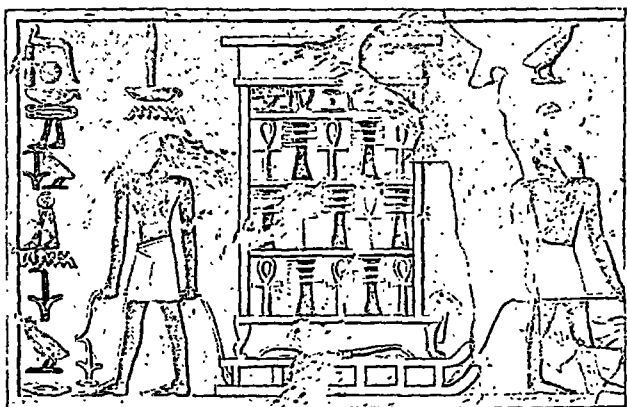
From Deir el-Bahari, Egypt Exploration Society

build sea-going ships and to embark on maritime adventure was provided by the need for resins, incense and timber for these purposes—the striving after the elusive hope of immortality, which more than fifty centuries ago the Egyptians imagined they could attain through making the corpse incorruptible and by supernatural means reanimating it.

From the ritual performances that were supposed to effect these supernatural results there developed the drama, dancing, music and most of the games that form so large a part of the interests of modern peoples—and in particular those forms of sport that many people are apt to regard as British inventions of the last century! The games are not to be explained merely as the natural and obvious ways of expressing our innate skill and rivalry, nor are music and dancing wholly spontaneous expressions of the emotions of joy or sorrow. They are respectively the modified survivals of ritual combats and life-giving ceremonies inspired by supernatural motives.

The tug-of-war is represented in a picture engraved in an Egyptian tomb built more than thirty centuries ago as a sacred conflict between

representatives of Upper and Lower Egypt to obtain possession of the king's mummy. Essentially the same idea has survived until the present day in Burma, where, according to Sir Richard Temple, at the funeral of a pöngyi, or monk, there is a tug-of-war to ascertain which side is to have the merit of dragging the body to the pyre. In ancient times in India the tug-of-war between good and evil beings was the means whereby the amrita, or elixir of life, was churned to provide the gods with the divine food that made them immortal. The pictures of this episode are



TUG-OF-WAR FOR POSSESSION OF A MUMMY

The hieroglyphs on this section of frieze from an Egyptian tomb tell us that the two figures are officiants representing the North and the South, and that they are contending for the possession of a deceased nobleman's bier. In some such ritual the tug-of-war may quite possibly have originated.

From 'Five Theban Tombs,' by N. & G. Davies



TUG-OF-WAR IN INDIAN LEGEND

The Egyptian tug-of-war shown in the preceding page has its counterpart in Indian mythology. Even an early eighteenth century work, to illustrate a garbled account of an incarnation of Vishnu, gives an engraving that embodies the same idea.

From Picart

found not only in India and Indo-China, but as far afield as Japan and, it would seem, even in Central America.

But supernatural ideas were responsible for the invention not only of the tug-of-war, but also of most games of skill, such as football and cricket, tennis and polo. The intimate association of ball games with churches and with religious festivals persisted until modern times in Europe. But if we trace their history farther back we shall find them in the form of ritual contests between royal combatants, in which kingdoms were at stake or, earlier still, the attainment of immortality was the prize, for the winner became a king and therefore a god.

But the idea of the supernatural was the underlying motive not only in building up the material and the sporting aspects of civilization, but virtually every aspect of culture.

Social and political organization, clothing and ornament, furniture and jewelry,

organized warfare, the invention of currency and the sciences of astronomy and chemistry are among the ingredients of civilization that can be attributed to the inspiration of the supernatural. The influence of this dominating idea, in fact, is so intimately interwoven with the whole history of civilization and with every custom and belief that it would take many volumes to give an account of the manner of working of its fertile inspiration. All that I can attempt to do here is to give a general survey of its influence.

The original idea of kingship seems to have developed from the fact that the organization of the labour of the whole community became imperative when population grew so numerous as to call for control of the water used for irrigation. The irrigation engineer became the king, who in course of time acquired a reputation for supernatural power. He was not merely the controller of the water that made the fields fertile and provided sustenance and prosperity for every individual, but he came to be regarded as himself the giver of life.

But when the people accepted the belief that their prosperity was dependent upon the king's strength and virility the ruler was placed in a very invidious position. For when his health or strength showed signs of failing he became a danger to the state; and he had to be killed to give place to a younger and more virile source of life-giving powers. This seems to have been the reason that impelled men to invent human sacrifice. When the king attained sufficient power to prevent himself from being killed his priesthood obtained a victim to take the king's place and invented the excuse that the Great Mother had prescribed human blood as the elixir of life that would rejuvenate the king who was growing old.

The constitution of the earliest state, the origin of human sacrifice and primitive warfare (which was essentially head-hunting for sacrificial victims) and the vast political and social results that emerged from these several institutions can all be attributed to the supernatural belief in the original king's power of life-giving.

But when, in spite of his rejuvenation, the king died, he was believed to have attained a prolongation of existence and become a god. This transformation was held to be the direct result of the embalming of his body by his successor, the reigning king, who was his living representative on earth. By rendering his body imperishable the king was believed to have secured the god's continued existence. Food and drink were periodically provided to sustain him, and ceremonies for bringing about reanimation were believed to enable him to partake of the food and to exercise his beneficent powers for the welfare of the community.

In coronation ceremonies that are still observed in Europe and Asia these ancient conceptions of the kingship still survive. The forms observed for crowning a king and giving him rebirth with a new name are modelled on the ritual of deification of the dead king as Osiris. All the supernatural symbolism for conferring a new personality upon the deified king is observed in crowning an actual ruler in our times.



REANIMATING THE MUMMIFIED DEAD

In this scene from an Egyptian tomb Anubis, the god of the dead, lays the corpse on the funerary couch, while the soul of the dead man, in the guise of a human-headed bird, 'reanimates' it by applying magic symbols to its nostrils.

From these beginnings there rapidly developed a complex political and social organization, with the kingship and priesthood and a multitude of ritual ceremonies to give expression to the supernatural beliefs involved in the strange theories underlying, and providing the incentive for, these innovations. But, many centuries before the state and the kingship came into being, and agriculture and temple ritual were invented, other beliefs giving expression to the same order of ideas had grown up and begun to exert a profound influence that has continued ever since.

When Man first began to realize the dangers to which his very existence was exposed it became the conscious aim of all his endeavours to devise means for his own protection. The dominant instinct of all living creatures is



MAGIC FOOD FOR AN EGYPTIAN MUMMY

Once preserved as a mummy, and reanimated by the appropriate ceremonies, the dead Egyptian king or chief was thought to have attained immortality. Food was provided for his sustenance, and even magic models of butchers, brewers and bakers; these 'came to life' to serve him in the next world.

self-preservation. Even if it be admitted that on rare occasions the sexual instinct may have an influence on the mind so compelling as to drive human beings to imperil life, it is obvious that as a general rule all the activities of living organisms are consciously and unconsciously working for the preservation of the life of the individual. When Man first began to devise means for averting the risks which everywhere threatened his existence, his actions gave expression to the theoretical views he had formulated as to the nature and source of life.

The earliest members of our own species whose remains have been recovered in the Grottes des Enfants at Mentone (see page 217),
 Vitality residing at Prédmost in Moravia,
 in Red Ochre in the Dordogne Valley and elsewhere in France,
 and in the Paviland Cave in South Wales, had red ochre and shells placed in the grave with their bodies. There are reasons for believing that the red ochre was put there as a substitute for blood, which was regarded as the life-stuff, and the shells as a symbol of birth, or life-giving. Both red ochre and shells were amulets believed to be capable of adding to the deceased's 'vitality'—in other words, of increasing his chance of prolonging existence.

If these ideas seem puerile and fantastic, we must admit a certain rational excuse for their adoption by people who lacked the accumulated knowledge and experience that our own ancestors have handed down to us. Death at first seems to have been associated only with such injuries as caused a free loss of blood, and death from other causes was not recognized as such. It was looked upon either as a state of sleep or trance, or as the result of some physical injury inflicted by another human being. Since wounds were the only admitted cause of death it was not illogical to regard the blood that escaped from the wounds as the actual life-stuff, the substance whose loss caused unconsciousness and death—the blood that is the life thereof,' as the Old Testament expresses it.

If, then, it were believed to be established that blood was the actual material source of consciousness, it was not wholly

illogical to believe that the exchange of blood could effect a community of knowledge, and that the offering of blood could add to an individual's supply of vital substance, or, in other words, avert the risk of death.

It was merely one step further to regard red substances, like red ochre or carnelian, as efficient animate substitutes for the living blood itself. Obviously the belief that such inert substances can exert any active powers of life-giving is devoid of all rational justification. The speculation involved in such claims for magical properties is clearly a supernatural belief.

Primitive man, however, was obsessed with the desire to clutch at any straw that might seem to save him from danger. He explored all the avenues of knowledge of the natural processes of life-giving and life-destroying, with the object of devising means to protect his own life and safeguard his welfare. The idea of wearing clothing had not yet been developed. In those primitive days, when all the facts of human life were open to the observation of everyone, Man's thoughts

were directed to the mystery of birth and life-giving. Women were not only the mothers of children but the source of their life. How to explain this mystery was beyond the powers of primitive men, but they conceived the idea that the representation of a woman in the form of a statuette, with the distinctively maternal characteristics displayed in an exaggerated form, would provide an amulet potent enough to give life and prolong existence (see pages 206-8). Moreover, they began to use cowries and other shells as particular symbols of woman's special powers of birth-giving and life-giving.

The earliest known remains of *Homo sapiens* were provided with these life-giving shells. To this day many primitive people still wear such shells as a protection against personal danger, and put them in the graves of their dead to ensure a prolongation of existence.

In early times the attempt seems to have been made to combine in a single amulet the symbols of the powers supposed to give life and to preserve from

the danger of death—to make models of cowrie shells which would also be statuettes of women. It must not be assumed that the idea of making these female statuettes necessarily implied a belief in the existence of a goddess. All that we are justified in inferring is that the amulets which were invented were believed to be capable of conferring life.

This belief in life-giving is the essential motive underlying all supernatural beliefs, and is the idea that prompted all human progress. The satisfaction of the craving for life and resurrection is the aim of every religion. The fundamental instinct of self-preservation does not only find articulate expression in religion, but provides the motive of all mythology and folk-lore. Religion, mythology, folk-lore are all so many varied expressions of Man's craving for safety and prosperity.

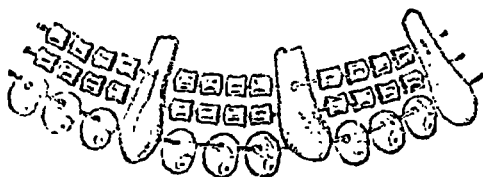
The supernatural idea expressed in shells as symbols of the giving of life had a profound influence on the history of civilization. The very great value assigned to cowries, because of the tremendous religious and social boons that they were believed to be able to confer, caused them to be sought after far and wide. Hence they acquired an arbitrary value as currency, which the money-cowrie still retains in Africa.

But nearly sixty centuries ago the difficulty of obtaining these magical shells in numbers sufficient to meet the demand was being met in a variety of ways. Many other varieties of shells were being used as substitutes, and models were made of the cowries and other shells in clay, in a variety of minerals and above all in gold. This was probably responsible for conferring upon this metal the arbitrary value that has made it one of the most important material factors in the history of civilization.

No more striking illustration can be adduced of the far-reaching influence of a supernatural belief upon the material basis of our modern civilization than the history of gold.

In the ancient literature of every people whose writings are known, there is ample evidence of the peculiar magical

properties attributed to gold. Thus, for example, in the ancient Indian work, the Satapatha-Brahmana, gold is said to be immortal, born of fire, the rejuvenator of mankind, conferring long life and many offspring upon its possessors. It is believed to be the seed of the god Agni, even a form of the gods themselves, and not



MAGIC SHELLS IN PREHISTORIC GRAVE

The use of cowrie shells as money is familiar. They were originally considered a life-giving charm; and furthermore imparted their virtue to all other sea shells, so that we find shell necklaces such as this even in palaeolithic tombs.

From Verneau, Les Grottes de Grimaldi

only immortal and imperishable but also identified with fire, light and immortality. Gold was endowed by the sun with its beautiful colour and lustre, and shone with the brilliancy of the sun god. Hence it became a source of life and lustre. Thus we have clear evidence of the divine nature of gold among the Indians. It was the sun god, it was his seed, it was the source of life and fertility.

These terms are not expressions of poetic fancy, but an attempt to give exact expression to the beliefs of ancient times when men imagined that they had rational grounds for such ideas.

But there are indications of other kinds to reveal that the search for gold played a dominant part in influencing men's behaviour in India many centuries before the Satapatha-Brahmana was written. If the wanderings of the earliest Aryan-speaking invaders of India are plotted out on a map, it will be found that every place mentioned in the Rig-Veda, which Sanskrit scholars have been able to identify, is a site where gold is to be found.

But in southern India, also, archaeological evidence gives an even more emphatic proof of the fact that the earliest civilization was introduced into the Deccan by gold-miners. The most ancient stone structures (dolmens and stone circles—see page 452) are found in certain regions of Hyderabad, Mysore

and elsewhere, but always in close association with extensive and long-forgotten gold mines, the very existence of which was quite unsuspected until revealed by archaeological exploration.

It was not only in India and Persia, however, that men were searching in ancient times for the golden elixir of life. Many centuries earlier than the arrival of the Aryans in India, the chief deities of the Sumerians, the inhabitants of Mesopotamia, were called Lords of Gold.

Taking our survey still farther west, and to an even more remote epoch in time, the Egyptian sun god Ra, in the pyramid age, was believed to be the procreator of kings. He gave them life, strength and endurance, so that in their veins coursed 'the liquid of Ra, the gold of the gods and goddesses, the luminous fluid of the sun, source of life, strength and persistence.'

We find, too, that gold was identified with the Great Mother, the Divine Cow Hathor. The ancient Egyptian word for gold, 'nub,' was particularly associated with her; and the determinative of her divinity (a necklace of golden pendants, probably models of cowrie shells) gave its name—Nubia—to the place whence the metal was first obtained, which was regarded as Hathor's own province.

Thus there can be no doubt that when it first came into use gold had the reputation of being a divine substance. It was identified with the gods and goddesses who controlled the giving of life. But the bare statement of this fact affords no adequate idea of the vast significance of such a belief.

At the time when civilization came into being and the idea of a masculine deity was formulated, the god (Osiris) was simply the dead king, whose existence,

as we have seen, was supposed to have been prolonged by means of certain animating ceremonies. The essential difference between the gods and men was that the former had acquired immortality; and so a distinction was created which has survived in our common speech in the use of the term 'mortals' for mankind. Substances credited with the power of prolonging existence were therefore called 'divine,' in the sense that they were the instruments whereby the distinctive attribute of divinity, that is, a prolongation of existence, could be conferred upon a dead king so that he might be transformed into a god.

During the past fifty centuries the Kingdom of Heaven has become so democratised that it is now open to all classes of mankind; but originally the divine right of attaining immortality was the king's exclusive privilege. Hence the attribution of these vast potentialities to gold, its identification with the life-giving powers of the Great Mother herself, gave

the metal a tremendous reputation for magical power, which not only prompted early rulers to send out expeditions to obtain the means of attaining immortality and divinity, but also laid the foundations of the glamour that has crystallised around the conception of gold in later ages.

The earliest evidence of the use of gold has been provided by the examination of the pre-dynastic cemeteries in Egypt, which proves that the metal was already employed as a material for covering beads of clay or soft stone before 3500 B.C. But the most instructive examples of early gold work are the objects found by Professor George A. Reisner, at Naga ed-Der in Upper Egypt, and by J. E.



RA, SUN GOD OF THE EGYPTIANS

It was feigned in ancient Egypt that the sun god, Ra, was the actual father of all the Pharaohs, so that in their veins flowed 'the liquid of Ra, the gold of the gods.' Gold thus had magic properties.

From the Berlin Museum

Quibell at Hieraconpolis, which belong to the time of the first Egyptian dynasty (circa 3300 B.C.).

In a grave estimated to belong to the middle of the First Dynasty, possibly synchronous with King Zer, Dr. Reisner found ten beads, each made of an egg-shaped case of beaten gold filled with a light cement, twenty-four models of shells (snail shells) made of heavy beaten gold, the model of a male gazelle in beaten gold, with the representation of a band around its neck bearing the sign of the goddess's girdle, and also a golden bull with a neck-band bearing the design of the goddess Hathor's head. Thus the earliest examples of shaped gold represent shells and other objects definitely associated with the goddess Hathor. As we have seen already, the goddess was herself identified with gold, and her hieroglyphic symbol was a necklace with pendants that probably represent cowrie shells.

When the kings of Egypt accepted the belief that the prolongation of their existence after death (and the consequent attainment of the immortality that would make gods of them) depended upon making adequate material preparations for effecting their purpose, expeditions were sent to collect gold. It was used with the almost incredible lavishness which we have witnessed in the case of Tutankhamen's tomb, to make absolutely certain the attainment of divinity by the dead king. The pictures in the tomb of Tutankhamen's vizier, Huy, show that supplies of gold were being obtained from the Sudan in the fourteenth century B.C. Dr. Reisner's recent investigations in the Sudan itself have completed the story of the exploitation of the south.



TOMB STATUE OF A GOLD MINER

It is perhaps significant that Sa-Hathor was the name of a man who, in the reign of Amenemhet II, was identified with the gold mining in the Sudan. Gold was the emblem of the goddess Hathor.

From the British Museum

When it became a matter of national policy thus to search for gold, the mere demand for the metal further enhanced the value that its use for making personal amulets had created. Hence the metal acquired a recognized position as a medium of exchange long before it became used, at any rate widely, as ordinary currency.

The Dark Ages, when men were still searching for the elixir of life and the philosopher's stone to transmute base substances into divine gold, represent the stepping stone from ancient times, when the semi-religious and magical reputation of gold was still obtrusive, to the frankly commercial and aesthetic values of gold in modern times.

If the search for gold was responsible in greater measure than any other factor for disseminating throughout the world the germs of our common civilization, it must not be forgotten that its influence was not wholly beneficent. The growth of the appreciation of gold made it not merely the basis of currency, but also the instrument of greed and an incentive to strife. Gold has, perhaps, played a more important part in exciting discord and provoking warfare than almost any other material factor; and we can be sure that if the era of peace and happiness among men, which Hesiod with unconscious irony has called the Golden Age, ever existed it was ended mainly by quarrelling excited by the greed for gold.

The glamour of gold has been perhaps the most potent factor in the history of civilization, and the concrete effects of the reverence in which it was universally held are the most emphatic illustration of the influence of beliefs unsupported by reason in promoting material progress and the world-wide diffusion of culture.

It has been suggested earlier in this account that gold acquired the reputation for life-giving from its identification with the supernatural properties of amulets such as cowrie shells. But the influence of the supernatural virtues associated with shells is not exhausted with the estimation of the part played by gold and metals in the history of civilization.

Long before the earliest use of gold, shells seemed to have acquired a definite magical significance. Thus in southern

Europe, bodies buried during the so-called Upper Palaeolithic period had a variety of sea shells placed upon them. At Laugerie-Basse, in the Dordogne, Mediterranean cowries were used for this purpose; whereas at Mentone fragments of the shell *Cassis rufa* were found in the same stratum as the skeletons of Upper Palaeolithic men (see illustration in page 217). As this shell is not known to occur in the Mediterranean, the possibility is suggested that it was brought all the way from the Red Sea.

There can be little doubt that the magical significance attached to shells was originally devised with reference to the cowrie, and probably upon the shores of the Red Sea. The cowrie came to be regarded as a symbol of the life-giving powers of women; and so developed into an amulet credited with power to protect the living from the risks of death, and to confer upon the dead a prolongation of existence.

The virtues originally associated merely with the form of the cowrie came to be attributed to this mollusc as a shell, and then were transferred to many other kinds of shells. This is shown by the fact that a variety of shells was used in the Upper Palaeolithic period, and that snail shells modelled in gold, of the period of the First Dynasty, were found in Egypt by Dr. Reisner.

The cult of shells was responsible for conferring upon pearls their arbitrary magical value. They were believed to be the very quintessence of the life substance. The search for them and for pearl shell has been one of the most important factors in the diffusion of culture, more particularly in the world east of Africa.

But the supernatural virtues associated with shells were probably also responsible for the invention of clothing. At the present day it is the practice in parts of Africa and Oceania for girls to wear girdles of cowries. In early times this custom was more widespread, and we know from the ancient monuments of India and Central America that the girdles were not restricted to girls, but that men and women also wore them.

From such practices the invention of clothing may have originated. When human beings lived in complete nakedness, and knew no other state, they could experience no feeling of shame or sense of immodesty because of their condition. But when shell pendants were worn on girdles the psychological fact was discovered that such devices could add to a girl's attraction. Hence the wearing of a girdle came to be recognized as a means of enhancing natural allurements.

In ancient literature this fact is established very clearly. The magic girdle became a love-provoking charm. In the Babylonian epics, when Ishtar, the goddess of love and war and mother of all life, removed her girdle all reproduction was temporarily stopped. Aphrodite's girdle had the reputation of being able to compel love. Brunhild's strength lay in her girdle.

In the Biblical narrative it is suggested that Eve's girdle of fig leaves was made to hide her nakedness; but it is more probable that the consciousness of nudity was the result rather than the cause of the wearing of the girdle. Nevertheless, we can assume that Eve's girdle was the prototype of clothing.

The most significant revelation of supernatural influence is displayed in the powers attributed to the sky world, or heaven, in the control of human destiny. But before considering this aspect of the matter, I must make some reference to the cow, which in the earlier theories of celestial influence was identified with the sky. The problem before us is how the moon and the cow came to have the relationship that we find in the old rhyme, which tells that 'the cow jumped over the moon.'



A FEMININE FASHION THAT HAD ITS ORIGIN IN SUPERSTITION

In early times, girdles of cowrie shells were worn as life-giving charms; that seen in the carving of Sirima Devata (left), an Indian goddess, in the Bharahat Tope (third century B.C.), for example, plainly symbolises her productivity. Modern Polynesian girls (middle) wear a similar girdle, partly because of the magic attributed to it, partly as a garment—which hints at the origin of clothing. The ornamental use of cowries, as in the dress of this Bornean woman (right), is widespread.

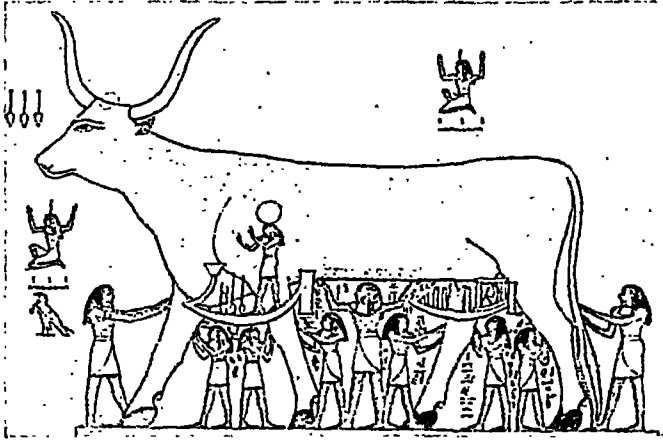
Left, from the Bharahat Tope; right, photo, Dr. Charles Hose

To a simple and unsophisticated people the realization of the fact that the cow could provide milk for the nourishment of human children came as an astounding revelation, which set men wondering as to the meaning of so novel a discovery. The Egyptians seem to have solved this problem by claiming the cow as a foster-mother of mankind, and eventually by identifying her with the Great Mother, who was at the same time elevated from the rank of a mere amulet (shell or statuette) into an actual living being, the Divine Cow, afterwards called Hathor, the great giver of life.

When the art of agriculture was invented it became necessary to measure the passage of time so that the appropriate season for planting the barley might be

known. In Egypt, where there is no sharp demarcation between summer and winter, or between a rainy and a dry season, men's attention became focussed on two natural phenomena as indications of the passage of time. The inundation of the Nile, which overflowed its banks in the middle of July, gave the measure of the year and determined the period of New Year's Day (about July 20). The phases of the moon measured the months of the year.

In trying to discover how the moon became identified with the Great Mother, the Divine Cow, there seems to be little doubt that the coincidence between the moon's cycles and the physiological periodicity of women convinced the earliest students of celestial phenomena of the causal relationship between the two.



HATHOR IDENTIFIED WITH THE HEAVENS

The Great Mother being identified in Egyptian belief with a cow on the one hand and the moon on the other, it is not hard to see how the Divine Cow became a symbol of the heavens. In this bas-relief the god Shu and his helpers support the star-studded cow over the earth beneath.

From the tomb of Seti I

The moon was credited with the control of women's destiny, and in particular with the regulation of their life-giving powers. But as this was also the chief duty of the Great Mother, she came to be identified with the moon, the celestial chronometer and controller of the tides.

Many factors played a part in the process of identification of the Divine Cow with the sky, but no one who has studied the bas-reliefs in ancient Egyptian tombs can be in any doubt as to the fact of this assimilation. It was due, however, to a somewhat confused and inconsistent blending of ideas, because, in addition to being the sky itself, the Divine Cow was also the vehicle for conveying the dead to the sky to attain everlasting life there.

The several identifications of the moon with the Great Mother and Divine Cow, and the subsequent modification of the idea to make the whole sky the Celestial World, represent the stages of belief that led to the conception of a heaven to which the divine dead go when they leave the earth. Such ideas have exercised so vast an influence in the history not only of religion, but of all belief and scientific theory, that it is essential to submit them to further examination.

The sky was conceived as an actual place to which the dead were transferred; and the problems of early theologians were concerned with the physical

means whereby the transference was effected.

The dead might arrive at their destination by wandering to the west, where earth and sky meet; or simply by mounting on the back of the Divine Cow, which is the sky—in this way the rider got there, so to speak, in one stride. Among other transmigration devices that appealed to ancient man were sailing up the earthly river until it became confluent with the celestial stream; using ropes or ladders; being transformed into a falcon, or simply 'going up in smoke.'

We are not now concerned with these physical problems

of celestial locomotion, and I refer to them only to emphasise the concreteness of the conceptions of early people. It is important, however, to discover how the system of astrology came into being.

Reference has already been made to the inauguration of the belief in a sky world inhabited by the great luminary who controlled the destiny of human beings, measured time and regulated the tides. The stars became drawn into this cycle of reasoning by certain observations of **Sirius and the** the movements of **Egyptian solar year** Sirius, one of the seven stars of the constellation Canis Major. After being invisible from the beginning of June this star reappears in the east some minutes before sunrise towards the middle of July. Its reappearance coincided exactly with the beginning of the period of Nile floods in Middle Egypt—the most important event in the year, and the one which probably marked the earliest determination of the length of the year in the world's history.

In this unfailing coincidence there seemed to be the most manifest sign of an indissoluble connexion between the spring-tide of the river and the rebirth of the star. The reappearance of Sirius marked the beginning of the new year, but in addition it was the dog-like companion of the Sun, upon whose movements the more reliable

solar calendar was based. As observations of Sirius enabled men to predict with certainty future events upon earth, it is not surprising, especially when it is recalled that the personal influence of the moon upon human beings was already an accepted doctrine, if it was further accepted that observations of the stars would enable men to foretell the future. Men believed that it was possible to predict not only such mundane events as the succession of the seasons, the movements of the river and the tides and the periods of the harvests, but also the destinies of men and women.

The whole system of astrology developed out of such speculations, and for many centuries throughout a great part of the world it controlled the

behaviour of countless men. Not only so, but out of the observations of the astrologers there eventually emerged the stricter discipline of astronomy, which has enabled us to appreciate something of the real nature of the universe. Astronomy has also guided mariners in their wanderings with infinitely greater reliability than the exploded phantasies of the astrologers were believed to steer human beings through an intricate terrestrial career.

The idea that the sky was the great repository of life-giving substances is the motive underlying most of the myth and ritual of relatively primitive societies. This is most clearly revealed, perhaps, in the accounts of some of the North American tribes so fully and clearly recorded in the Reports of the Ethnological Bureau of the United States.

Take the case of the Zuni Indians: the published statements of their beliefs define quite frankly and unmistakably the real meaning of their religion. For they say that the aim of their ritual is to bring down from the sky the breath of life for the benefit of people on earth. Myth

and folklore are, as a rule, merely the explanations of the ritual practices. The ritual of the Zuni is typical of all religious ceremonial, the essential purpose of which is the giving of life or its safeguarding by supernatural powers.

Belief in the possibility of prolonging existence after death only became articulate and concrete when the art of embalming was invented. By this means the possibility of making the body incorruptible was realized. Religious ritual in many parts of the world is based upon the practice of mummification and the ceremonies for reanimating the mummy. The opening of the mouth confers the breath of life, the offering of libations the water of life and the burning of incense the odour of the living. The ritual for the bringing about of resurrection is based upon the practice of mummification.

When the art was first devised the mummified king, Osiris, was believed to attain his eternal home on earth, for the idea of the Celestial Paradise had not yet been adopted. But the dream of an earthly paradise, the Hesperides, the Isles of the Blest, or whatever it might be called locally, where gold and other elixirs of life could be obtained in unlimited quantities, was not destroyed when the



BORNE TO HEAVEN BY THE DIVINE COW

Quite in keeping with the confused nature of Egyptian myths was the belief that Hathor or Nut (herself, remember, the sky) appeared under her cow-form to bear the souls of the dead to the Celestial Paradise. Though the dead man is here shown, his soul is further symbolised by a bird.

After a coloured lacsmie in Leeman's Monuments Egyptiens

heavens came to be regarded as the source of the breath of life.

Even in the Middle Ages, when alchemists were still trying to discover the elixir of life and the philosopher's stone with which to transmute base metals into divine gold, the magic of the earthly paradise was still a potent element in the incentive to maritime adventure. Christopher Columbus was inspired to embark on his great expedition to the west not only to find a route to India and to obtain material gold. Elusive dreams of the Isles of the Blest far out in the Western Ocean were not without some influence in their appeal to his mysticism. Of one of these stories Alfred Nutt wrote :

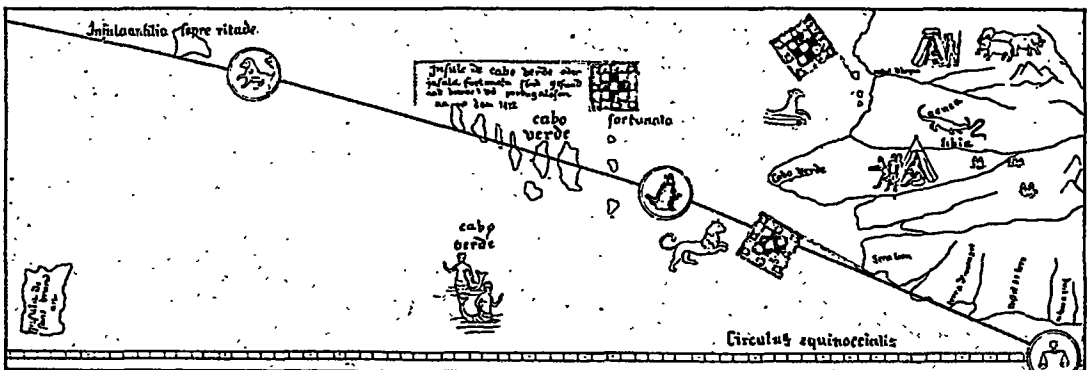
The voyage of Saint Brendan, which touched so profoundly the imagination of medieval man, which was translated into every European tongue, which drove forth adventurers into the Western Sea, and was one of the contributory causes of the discovery of the New World—the voyage of Saint Brendan is but the latest and definitely Christian example of a genre of story-telling which had already flourished for centuries in Ireland, when it seemed good to an unknown writer to dress the old half-pagan marvels in orthodox monkish garb, and thus start them afresh in their triumphal march through the literature of the world.

It would be difficult to imagine a more widespread and potent influence upon human destiny than that exerted by this supernatural idea of the existence, somewhere across the sea, of a land of eternal youth, rich in magic power to confer prosperity and happiness in this life and

immortality in the life to come. The alchemists' endeavours to discover how to make the elixir that was found in this paradise led to the creation of the science of chemistry, which has transformed modern civilization.

The search for gold was the main factor in stimulating geographical exploration and diffusing the germs of civilization throughout the world. But if these effects of the development of the idea of supernatural forces that we have discussed are the more obtrusive, it must not be forgotten that they are merely a part of the much more profound and widespread influence of primitive religious beliefs which affected every individual, and promoted the desire to obtain these potent givers of life that would safeguard his destiny. Civilization itself is really the outcome of such striving.

The life-quest, however, did not only stimulate the more beneficent aspects of a progressive culture ; it was responsible also for the institution of what are perhaps the grossest forms of brutality that man has ever perpetrated. The practices of head hunting and most of the internecine war of relatively uncultured peoples were prompted by the search for elixirs of life in the form of human blood. Belief in the supernatural forces that were (and still are) supposed to control human destiny has been responsible, ultimately, for most of the persecution, resulting from intolerance, which men have inflicted upon their fellows throughout history.



LAST LINGERING DREAM OF AN ISLAND PARADISE ON EARTH

Through the ages the thought of an earthly paradise, which had its germ perhaps in the legend of Osiris, never quite died. The isle said to have been discovered by S. Brendan, or Brandon, a fifth century Irish monk, is a Christian version of the same idea. As knowledge grew, the mysterious isle receded from Ireland, until in this strip from Martin Behaim's globe (1492) we see it (in the left-hand corner) west of Cape Verde. This was the year before the return of Columbus !

WOMAN: HER STATUS AND ITS INFLUENCE ON HISTORY

Wherein it is argued that one Half of the Human Race has been all but neglected in Historical Research

By Mrs. RAY STRACHEY

Author of *Frances Willard, her Life and Work*, *Marching On*, etc.

As far back as history can be traced, women have been concerned in its making. They are, indeed, the raw material of history, being half the human race of which it is made; and yet, when we come to look closely, we find that there is a great darkness spread over the lives of women. Some few queens, beauties, prostitutes and saints have indeed left the pictures of their faces and the records of their lives to be a guide to the historian, but the other women, the mass of the virtuous and undistinguished, are all merged in the obscurity of the past.

We know, in a general way, how people lived; we know what economic changes were going on, what movements of thought, learning, military strategy or politics were afoot at different periods. But what actually happened to the ordinary woman in her own house at different stages of history we can, even now, only surmise. The working conditions of men, their customs and the implements of their trades, have all become clearer to our eyes under the researches of modern historians, but even now the state of women's progress is apparent only by inference. For women, throughout the ages, have been considered 'relative' to men.

Men it is, we are accustomed to think, who have carried civilization forward, while women have come along behind, keeping the hearth and the home for them and bringing their children into the world. That has been, and still is, the accepted view of history; and in the light of it women have not particularly occupied the thoughts of historians. Except for discussions of marriage customs and of sexual morality generally, a footnote now

and then in a score of volumes and an incidental reference here and there are all that the subject has seemed to require. For is not the history of Man the history of Woman, too? Are they not both human beings, and have they not both the same interests?

It would be absurd to pretend that there is not much truth in this view. Famine, fire and flood must always be the same for men and women. The cold strikes both alike, and the sun warms them; life and laughter, love and sorrow, and death at the end of it all; when these things alone made the history of mankind there was no woman question. When our ancestors lived in caves and trees, when they built their huts of mud, and went in terror of the wild beasts, the history of men and women was the same.

But for ages past there have been many elements besides these simple facts in human life. It has been governed by obscure forces, and has changed and developed under the influence of *Diverging paths of Men & Women* human thought. Long before any of our records began, new ideas and new conceptions were added to the raw stuff of human life; and, with the first organization of warfare, of agriculture and of magic, the paths of men and women began to diverge. Their different lives date, indeed, from the first attempts of mankind to live in communities, and from the first stirrings of the great influence of religion.

From that time onward, though men and women have, of course, lived intimately side by side in a changing world, it is untrue to say that their histories have



WOMEN WHOSE SPIRIT AND EXAMPLE HAVE INSPIRED MANKIND

Catherine of Siena (statue by Neroccio, left) is exceptional among the female saints of the Christian calendar in that her political genius was as signal as her piety and mysticism. Many women, however, have been canonised on account of their steadfast devotion to the Christian faith in face of persecution; typical are the three martyrs seen above, as represented by great painters—from left to right, S. Agnes (Andrea del Sarto), S. Barbara (Palma Vecchio) and S. Cecilia (Carlo Dolci).

been the same. There has always been a special position for women, a 'status' different from that of men; they have lived in a sort of world apart.

If we could trace the two histories, that of man and that of woman, and could really measure where, and how much, they have been alike, we might reveal many new things. And in any true survey of the world we must do this; for, after all, relative, dependent, inferior as women have been held to be, they have always remained one half of the human race, and their history is half the human story.

There are four main factors which have governed differentiation of women's lives, and these are sex differences, militarism, economic forces and abstract ideas. These influences are very different in quality, and perhaps not to be compared one with another, but each has a direct bearing on

the problem of woman's status, and each is, to this day, fundamental.

The first factor, namely the physical differences between men and women, is, of course, the foundation of the whole story. If women had not been weaker than men, and had not been liable to the physical burden of motherhood, no division of labour on sex lines would ever have taken place, and none of the peculiar customs which have resulted from it would have made their appearance. What the development of history would have been in that case we can hardly imagine. Perhaps we should be like the bees, highly organized and efficient, but not individually interesting; or perhaps we should have been as we are now, only more evenly and more fully developed. The speculation is unprofitable, since human physiology shows no signs of changing;



ENLIGHTENED STATESWOMEN WHO SUCCESSFULLY RULED GREAT PEOPLES

Maria Theresa of Austria (left), Catherine the Great of Russia, Elizabeth Tudor and Queen Victoria—all are monarchs whose practical achievements give them historical prominence. Among the 'benevolent despots' of the eighteenth century, Maria Theresa and Catherine are pre-eminent, alike for their statecraft and their advanced views. Elizabeth devised a foreign policy that very considerably increased England's power; while Victoria was the ideal head of a democratic state.



WOMEN WHOSE REPUTATIONS ARE BLACKENED BY GREAT CRIMES

Agrippina the Younger and Messalina (left two) were both Roman empresses. The former plotted her way to power, never hesitating at murder; the latter used her high position as a means of gratifying her lusts. The two women of the Renaissance stigmatised as criminal are less justly condemned. Catherine de' Medici (extreme right) made assassination a political expedient; and it cannot be proved that Lucrezia Borgia was guilty of anything more lurid than weakness.

and it is more useful to consider whether we have been judicious in the super-structure that we have built thereon.

Here we are on firm ground. The assumption that women were inferior because they were less muscular prevailed in the world for centuries, and prevails still to this day. Such an assumption has undoubtedly brought about conditions which have tended to make women what they were thought to be. And a state of society which deliberately encourages half the race to be foolish, frivolous and irresponsible can surely not be wise.

The second factor which has tended to separate women from men has been the continual fighting in which the human race has indulged. Militarism, indeed, has always been damaging to the position of women, partly by the frame of mind which it engenders, and partly by the practical

consequences which it involves. Since they were comparatively useless in the days when fighting was a matter of individual prowess, women came to be regarded as the booty of conquerors; and the more warlike the lives of men have been, the more abject the lives of women have become.

This generalisation, of course, like all others, is too sweeping to be completely accurate. There have been many curious by-products of war all through the ages, and much might be learned by an examination of women's share in them. Perhaps the most unexpected of all has been the fact that the emancipation of women in so many parts of the world appears to have been the direct outcome of the great European War.

The explanation of this apparently incredible state of affairs is, however, simple



WIT AND BEAUTY USED TO OBTAIN GREAT POLITICAL INFLUENCE

Aspasia (left), first as the mistress and then as the wife of Pericles, played a leading part in Athenian politics. Cleopatra during her brilliant career had first Julius Caesar, then Mark Antony for lovers, and so consolidated her position in Egypt. Ninon de l'Enclos is typical of the courtesans of later days whose 'backstairs' aid was sought by the politicians who frequented their salons. Madame de Pompadour was more powerful at the court of Louis XV of France than any minister.



PRIZES WON BY THE CONQUEROR

In early warfare, where personal valour was the decisive factor, the womenfolk of a vanquished foe were seized by the victor as part of his legitimate spoils. This Assyrian bas-relief shows three women so taken by king Ashurnasir-pal.

From the British Museum

enough, this last war having been so completely different from any which preceded it. It was a war of economic strength, almost as much as of fighting, and in that field the comparative helplessness of women disappeared. They and their work were essential to the war, and their old position of passively waiting for the result was no longer maintained when

they were needed in the munition shops and factories of Europe. In the main, however, and especially in the early history of the race, militarism has been destructive of women's importance, and this, perhaps more than any other factor, accounts for the long ages of subservience through which they have passed.

Economic forces, on the whole, have tended to liberate women; but this statement, even more than the last, is subject to many exceptions. A study of this aspect of women's special history is, indeed, much needed, and would throw light on many puzzling problems. We cannot attempt it here; but its importance will be realized on casting even the most cursory glance at the prevailing conditions in industrial states to-day.

In them we see that the position of women is a standing menace to men: they form a labour force which is universally exploited and underpaid. Women are everywhere potential 'blacklegs' against the customary standards of life, and yet they are necessary and inevitable as producers. Ill organized, ill protected and ill paid, the working women of the present day have to carry both a man's and a woman's burdens, and the effect upon the race is pernicious. How has mankind allowed so preposterous a position to come about? Why has this most



DESTRUCTION OF THE ANCIENT ORDER OF SOCIETY IN MODERN TURKEY

The regime under which women were treated almost as slaves—a survival from the days of aggressive Turkish militarism—has been long-lived in Turkey. Harem conditions, symbolised by veils such as are worn by the two ladies seen on the left, still existed in 1923, but have subsequently disappeared; Turkish women now go unveiled in public (right), and are entering into many professions.

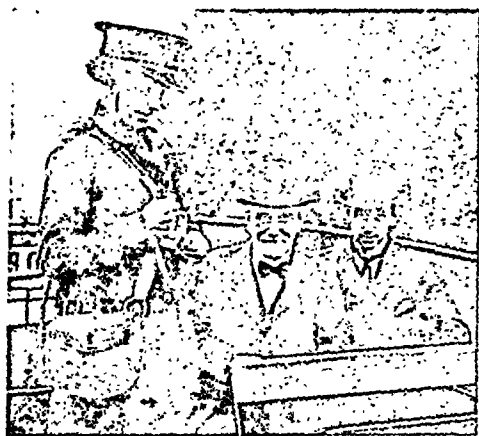
unnatural difficulty arisen? Orthodox history makes little attempt to answer, or even to ask, such questions; and politics, so far, have failed to resolve them.

The fourth great controlling force in the development of women, namely, theory, has been more carefully studied, and in the history of morals, of laws and of religions we can trace it with some degree of completeness. And a curious study it is.

Women have entered into this sphere of development to a considerable extent, not, indeed, directly, for the number of female philosophers, lawgivers, religious teachers and the like has on the whole been small, but as the subject matter for speculation and enactment.



women largely turn, and it seems to have been the one point about women which has always been taken seriously. There is a great mass of doctrine concerning the duties, crimes and virtues of women in relation to the other sex, and there remain laws, beliefs and preachments without number, from every age of the world, to remind us how important it has seemed that women, at any rate, should be virtuous. Sexual morality, indeed, has been thought the only important point in connexion with women, and yet even here no one has tried to ascertain what their own attitude towards the matter may have been. Have the centuries of women's passive acceptance of a purely physio-



VALUE OF WOMEN AS WORKERS SHOWN BY THEIR WAR-TIME ACTIVITIES

In the Great War of 1914-18 victory depended largely upon economic strength, and this gave women a new importance in the state. They were found to be efficient in many unexpected directions, such as the manufacture of munitions (on the left we see one turning shells); and they were widely employed to replace men who had gone to the front (right, a tram conductor).

In primitive days, so far as opinion can be traced by custom and by ceremony, woman was of considerable importance. It is true that the actual women of daily life were the merest slaves, doing the work of the tribe, and eating only what the men rejected; but in the worship of the gods, and in the mass of rigid taboos which regulated daily life, the idea of woman figured largely. The gods themselves were as much female as male—more so, indeed, since nature was commonly personified as a woman; and the taboos included a mass of complex arrangements regulating sexual intercourse.

It is this matter, indeed, towards which the accumulated theories concerning

gical status been the result of nature, religion, force, propaganda or—merely helpless despair?

It would be interesting to know how the primitive sex taboos appeared from the women's standpoint. What did they think of the group marriage system, in which every man of the group had a right to every woman, and every woman to every man? How did this strange system work, and how were human passions subdued to it? How, too, did polygamy and polyandry strike those who practised it? Which did the women prefer? And why did some races select the one, and some the other? And, more important still for our purpose, what effect did

matriarchy have on the world in which it appeared?

It is difficult to be sure what matriarchy actually involved. Its main principle, of course, was the tracing of descent through the female, and the inheritance of property by 'mother right,' which doubtless arose in conditions where paternity was an uncertain element. Matriarchy was not necessarily accompanied

When Mother Right was obeyed by any personal authority for the woman, as centre of the family, or any right to the headship of the tribe. There is, however, some slight evidence that it sometimes was so, and it is quite possible that there were two lines of development from matriarchy, the one leading to the slavery of the female, and the other connecting her in some way with the continuity of property, and assigning to her duties and privileges of a more independent nature. The field is still exceedingly obscure, and probably always will be, since all the evidence we acquire is confused and distorted by the inarticulate language and rudimentary records of primitive peoples.

From the evidence we have, however, it has generally been assumed that women have always held a wretched and inferior position, and that it is only now, in our present days of enlightenment, that the bonds are being loosed. We are accustomed to think of history as a steady advance from barbarism; but, if the position of women is any measure of civilization, it is not at all certain that a level as high as our own was not reached some four or five thousands of years ago, in the days preceding the settlement of the Indo-European races on the shores of the Mediterranean Sea.

Primitive savages developed into town-dwelling peoples and evolved settled laws in various parts of the world many thousands of years ago, and there is a possibility, if not a strong presumption, that women in several of these held a free and dignified position long before the Christian era.

Some of these early civilizations have doubtless entirely disappeared; about others we can only construct theories from the legends and myths of antiquity;

but the early Egyptian and Sumerian ages are known in some detail from the written records which survive, and we can partly reconstruct the manner of life which went on along the valley of the Nile, and between the Tigris and the Euphrates, from as early as 4000 B.C.

As we see in Chapters 15 to 18, there seem, in spite of the constant wars, to have been considerable security of life and expansion of trade, a postal system and highly organized courts of justice. What is even more unexpected is that women seem to have had, in Mesopotamia at any rate, a position almost the same as that of men. They could hold property, whether married or not, could enter into legal contracts, bear witness and assume responsibilities.

Both men and women engaged in trade, both acted as magistrates, governors and judges. Both could learn the art of writing and could carry on the profession of scribe; both could serve the gods in the temple, and the priestesses were wealthy and highly respected members of society, whose duty as temple oblates added a touch of holiness to the esteem in which they were held. Mothers were guardians of their children, and daughters inherited equally with sons—in short, the Mesopotamian states were in all these respects exceedingly modern.

In matrimonial affairs, however, there were some curious laws, which do not seem to be quite so enlightened in essence, and Marriage laws which remind us of the in Babylonia remoteness of the civilization. For although the right of divorce was equal, and either party could obtain it at will, with a separation of goods, yet if a woman resisted a divorce, and could be proved in the courts to have been a 'vexatious or negligent' wife, she was liable to be drowned!

Drowning, however, was quite a usual penalty, both men and women adulterers being liable to it, as well as other kinds of offenders. The punishment seems ferocious; but the justice which applied it to the male as well as to the female sinner has not been seen in the world again, from that day to this. It was, in short, an equal, if a primitive, world in which Mesopotamian women lived, as recorded in the



SERVANTS OF A HITTITE GODDESS

We know little of Hittite institutions, but bas-reliefs at Carchemish on the Euphrates, such as the above (c. 1000 B.C.), showed that priestesses played an important part in religious celebrations. These two are bearing gifts of corn and sacred ribbons to a goddess.

Courtesy of British Museum



SACRED OFFICE IN WHICH WOMEN HAVE EVER BEEN HONOURED

Priestesses have been influential and respected even where, as in ancient Greece, the position of their lay sisters has been deplorable. Their functions were various: there were, for example, the inspired utterers of Apollo's oracles at Delphi and the noble Vestal Virgins in Rome. Here we see an Egyptian priestess (Nineteenth Dynasty) with her husband, also a religious official; the priestess Eumachia from Pompeii; and a Greek ministrant about to 'purify' offerings in torch-smoke.

Photos, Fleming (top left) and Brogi (bottom left)

great code of Hammurabi, which was compiled about 2000 B.C.

In Egypt, over the same period, women seem to have been the chief owners of land, which passed mainly in the female line. They were in consequence legally responsible for the support of their parents.

Apparently they did not have quite so independent a position as in early

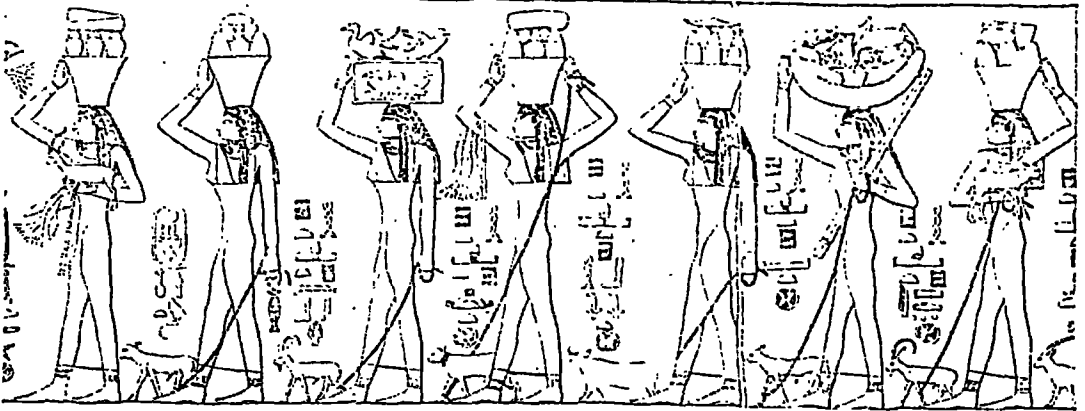
Sumeria, however, and although there are pictures of the Fourth, Fifth and Sixth Dynasties showing women engaged in farm work, and even one steering a ship, there is not much to indicate that they engaged in trades or professions, or took part in the government of the country, unless they were members of the royal families. The great queen Hatshepsut was long remembered, and seems to have been one of the really enlightened rulers of the world; but queens are a law to themselves, and their privileges have little to do with the status of the ordinary woman of their time.

There is nothing to show whether the state of equality which was reached in Sumeria was the result of a feminist agitation in the lost ages of the world. It seems much more likely, however, that it was the product of a civilization which grew out of the more advanced forms of matriarchy. Among such peoples, when the small family groups began to expand into town dwellers, women might quite naturally assume a position of importance

in the community; and as towns grew larger and security greater, the equality of the sexes might arise without difficulty or question.

Historians have spent much ingenuity in discounting this possibility, and have ridiculed the idea of any progressive development from matriarchy in the direction of female power; but there exist a number of ancient traditions for which it is difficult otherwise to account. In all the most ancient myths, for example, heroic women are to be found, whose claim to admiration is not their patience and submission, but their determined activity and almost alarming power. The sacred legends and the sagas of every race contain these half-divine female figures, and it would be strange indeed if they had never had any kind of human prototype. Yet, if the ordinary view of history is correct, the conception of these truly heroic women must have sprung up of its own accord, in a world where the living women were down-trodden and despised.

But is it likely in this case that the idea of the Amazons would have been invented? The legend of their existence was found all over the ancient world, and the ingenuity which has been expended in explaining it away has only resulted in somewhat unconvincing conjectures. We are told that they were men dressed as women—a curious uniform for war!—or that they were merely priestesses



WHERE WOMEN SHARED IN THE STRENUOUS LABOUR OF THE FIELDS

In Ancient Egypt women seem to have undertaken outdoor work on the farms, as they do in many modern agricultural communities. This wall painting from a Fifth Dynasty tomb at Sakkara illustrates one of their duties at harvest time—probably, as to-day, the season at which they were busiest; we see them bearing offerings of beasts and produce to their master from his farms.

From Margaret Murray, 'Sakkara Mastabas'

dancing war dances in the temples; but none of this is very probable. It is, after all, quite easy to conceive of tribes in which the women went out to war with the men, and we may abandon all the recondite explanations in favour of the simplest one of all. The legends of the Amazons arose because the Amazons existed—not, of course, in the exact conditions in which the Greek epic poets describe them, but in some sort of sober fact.

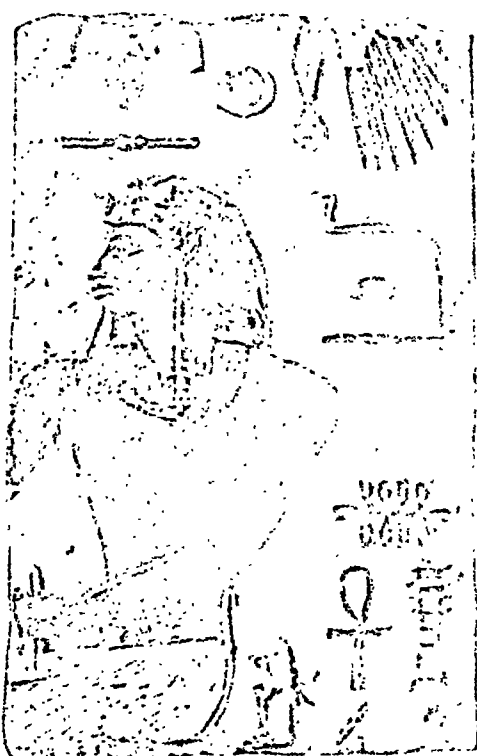
After all, fighting women have arisen from time to time in well authenticated history; they have been found among the natives of Dahomey, where they formed an exact and equal half of the standing army; a band of them arose in Bohemia in the sixteenth century, to overthrow a tyrannical duke; and as late as 1915 they were enrolled in regular legions of their own in the Russian Army, officered by women and paid and rationed in the ordinary way. Neither Boadicea nor Joan of Arc was a legendary warrior, and there is no reason to refuse a real existence to their forerunners in Lycia six or seven thousand years ago.

At any rate, whatever the origin of the Sumerian customs, their end is quite clear. Whether the position of women hastened or delayed their fall we cannot tell; but Babylon is now a heap of ruins, and even great Pharaoh has fallen from his throne; and the Semites and Indo-Europeans who replaced them introduced a very different tradition, which has dominated the world ever since.

As far as we can judge, by 1000 B.C. the races from which the Greek peoples arose no longer tolerated

Women enslaved any independence among in Ancient Greece their women. They had still the old heroic tradition, as their early literature plainly shows; and as the stories of Antigone, Electra and a score of others bear witness. At a still later date they indulged in speculation that was definitely feminist in character, as in *The Trojan Women* of Euripides, in Aristophanes' *Lysistrata*, and, above all, in Plato's *Republic*.

But none of this touched the daily life of the people, and during the centuries



A QUEEN REPRESENTED AS A MAN

Although Hatshepsut of Egypt proved that a queen could be a great ruler, she was conventionally regarded as a male Pharaoh. Thus, she is represented in her temple at Deir el-Bahri (as above) with the facial attributes of a man.

Photo, Egypt Exploration Society

when the Greek city states were so important the women within them played parts that were at once unimportant and degrading. Their lives were preserved, of course, for they were necessary; and, moreover, men found pleasure and satisfaction in them. Besides, they could be made useful in the routine matters of eating and drinking, clothing and cleaning; but they were kept strictly to these tasks. The tiresome theory that a virtuous woman's only place was her home had taken deep root before the great age of Greece, and so far was it carried that the Athenian women of the time of Euripides probably spoke a 'little language' of their own. No adventures of the mind or the body were to be theirs; a 'little language' and a 'little brain' were all that a 'little home' required.

Outside it, indeed, the small but influential class of 'hetærae' might be

leading brilliant and accomplished lives, enjoying a freedom and learning which were denied to the virtuous; but inside the sacred home women were bound by a system that made virtues of ignorance and blind obedience. Even in the matter of her children's lives the wife must be submissive. If the father willed it, the new-born girl baby must be taken away and left upon the hillsides, or in the city streets, crying dismally in its little earthenware jar until it died of exposure; and the mother might not say a word. For she was inconsiderable, a plaything set apart from the responsibilities of life.

been assimilated easily and quickly—but their influence was formidable; for as a rule they brought with them not the civilization of their old homes, but all that was lowest and most ignorant, all the prejudices, the superstitions and the follies on which they had been nourished. Shut out, both before and after their enslavement, from the learning and progress of their day, and herded about the world by the fortunes of war, women must have carried the germs of obscurantism from one people to another.

They it was who preserved the continuity of the ancient faiths, and built them



ASPECTS OF THE RESTRICTED HOME-LIFE OF GREEK MARRIED WOMEN

Despite the prevailing enlightenment, the position of women in most of the societies of ancient Greece was bad. Those accounted 'respectable' had no concern with intellectual matters or politics; their sphere was the home, their pastimes such as are illustrated above, on a vase of the sixth century B.C. A lady at her toilette (right) surveys herself in a hand-mirror while her maid holds a perfume jar; and (left) a woman works at an embroidery frame, watched by a visiting friend.

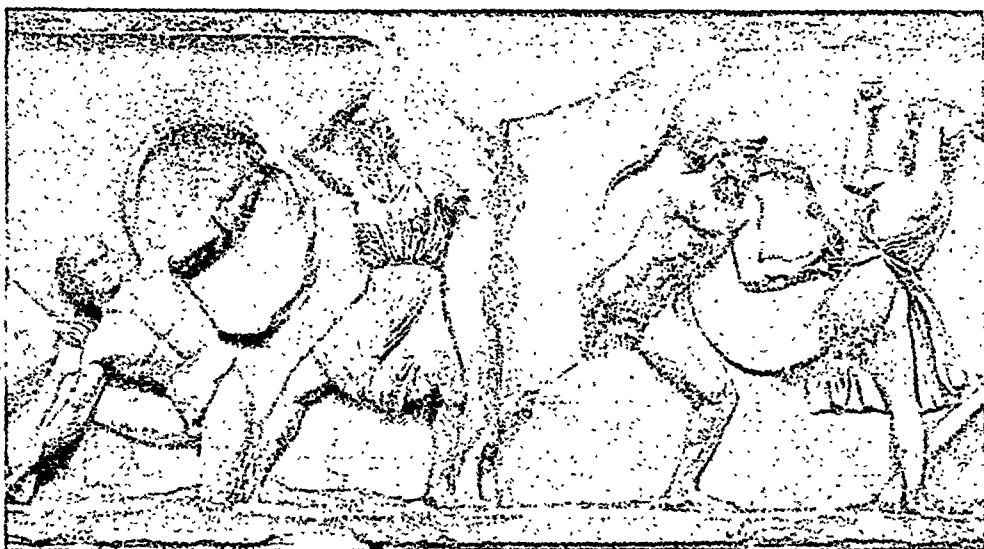
After Furtwängler

It is probable that for a long time the degradation of women was intensified by the continual wars of extermination which devastated the early world. When one people attacked another, and when one mighty city yielded, it was customary to kill the males and to carry off the females as part of the booty. These captive women probably played a far more important rôle than their masters imagined. They were considered as so much wealth, more workers and more breeders of children for the conquerors; but, unsuspected and unnoticed, they must have been a fatal source of weakness to their owners.

Sometimes they introduced an inferior or negroid blood into the race, and sometimes in more subtle ways they sapped its strength. It is true that they did not rise in revolt—indeed, they seem to have

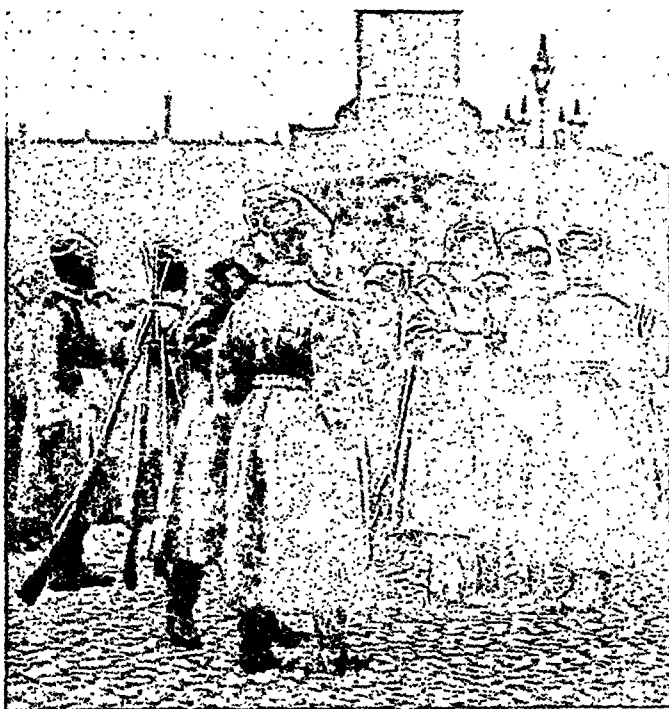
up, one above another, in layers of superstition and mystery. They it was, too, who retarded innovations among the sons of men, whispering their old wives' tales into the children's ears, and impressing upon their consciences the foreign taboos from which each generation was trying to escape. The worship of very ancient gods, with blood sacrifices and barbaric orgies, went on underground well into the Christian era; and so with all the other outworn things. These alien slaves, working subterraneously, must have dragged back the peoples for whom they toiled, and dragged them all the more surely because their place, and their only place, was the home.

Had the women of Greece shared the culture of the golden age, perhaps it might have lasted longer. There might have been no break in the great tradition, and



The Amazons of Greek legend were perhaps not entirely mythological creatures, even though the traditional accounts of these fighting women include some incredible features. Their idealised representations in art (as in this frieze from the Mausoleum) is often entirely realistic, and it is not improbable that the womenfolk of some of the primitive tribes encountered by the early Greeks took an active part in battle, and so caught the imagination of story tellers and ballad makers.

From the British Museum



Fighting women have existed outside the legendary tales of ancient Greece. The finest regiments of the regular army of Dahomey consisted entirely of such 'Amazons' as we see above (left), before this region came under French administration in 1892. During the Great War female combatants were enrolled in the Russian army, and, under women officers, formed the so-called 'Battalion of Death,' part of which is here shown, massed to protect the Provisional Government in 1917.

FEMALE WARRIORS WHO FOUGHT ON TERMS OF EQUALITY WITH MEN

the greatest literature the world has ever known might not have lain forgotten for so long, buried and lost amid a heap of broken stones. But it is useless to raise such speculations. Women were down-trodden, and the world has moved but slowly. That, in our present state of knowledge, is all we can safely say.

Between the fall of Babylon and the beginning of the Christian era there were undoubtedly variations in the status of women. The tribes of the north of Europe gave them quite a dignified position, whether because of climatic conditions, or because they had not yet outgrown their heroic age, we do not know. At any rate, monogamy was established at an early date, and the women of the Germanic tribes, as described by Tacitus and by Plutarch, were of considerable importance in their councils.

Curiously enough, they seem to have been particularly authoritative in matters least concerned, one would have supposed, with their 'sphere.' 'The Celts made it their practice,' said Plutarch, 'to take women into consultation about peace or war, and to use them as mediators in any controversies that arose between them

and their allies. In the league made with Hannibal, therefore, the writing runs thus: If the Celts take occasion of quarrelling with the Carthaginians, the governors and generals of the Carthaginians in Spain shall decide the dispute but if the Carthaginians accuse the Celts, the Celtic women shall decide the controversy.'

Whether their decisions were good or bad we do not know, nor whether their influence was for more generally observed peace or more desperate fighting. If we can believe Tacitus, indeed, the women were more fierce and warlike than the men; but, then, it was only at a time of conquest that he saw them. In any case, whatever the value of their public responsibility, women continued in private life to be the drudges of the tribes; carrying on the farm and field work, while the men lounged in stupid repose, their time passed in sleep and gluttony.

In Rome, where hand-to-hand fighting was not the prime business of the male population, and where a stable civilization grew up, women came to have a recognized

position at law, and attained considerable property rights. There was even one woman, Soaemia, who took part in the work of the Senate, voting for the ratification of laws, just as women do in so many Parliaments to-day. But Soaemia was the Emperor's mother; and the sight of her sitting beside the Consuls was so shocking that a law forbidding any woman ever to do so again was quickly passed.

The fact remained, however, that, even at the highest point of their importance, women were regarded as relative to men. All the tales of their heroism turned upon devotion to a father, a husband or a son; and the greatest fame that they could win, as Thucydides had said, was not to be mentioned by men, whether for good or evil.



TYPE OF ROMAN MATRON UNDER THE EMPIRE

The nobler Roman women of the early Empire, domineering as well as virtuous, highly educated and very intelligent, exercised direct influence upon public affairs. Tacitus records, for example, that Agrippina the Elder, the mother of many children, was 'a greater power in the army than the commanders.'

From the Capitol, Rome

So unimportant were women considered in the more civilized parts of the world at this time that they were held to have little to do even with the one function which was their claim to existence, namely, motherhood. They had, so the theory ran, no generative power at all. Inheritance came from the father, and the mother was only the nurse of the embryonic life, and played but a subordinate part in the production of children. It is no wonder that the devout Jew of those days would daily thank his God who had made him neither a Gentile, a slave nor a woman!

Doctrinal teaching has always been a very potent influence upon mankind, and, as a rule, whatever definite doctrine has found expression on the subject of women has been of a nature to keep her status low. The rise of Christianity, however, brought a doctrine which for a brief moment had the opposite effect. 'There is neither Jew nor Greek, there is neither bond nor free, there is neither male nor female—for ye are all one in Christ Jesus.' When this doctrine spread among the early converts to the new Messiah, women flocked into the church.

Here, at last, they found a religion whose main tenets were congenial, whose influence exalted the very virtues they had always been taught to pursue, and within whose bounds they

Women in the Early Church were themselves personally welcome. In its earliest years the Christian church depended very largely upon women, who became prominent and active missionaries, and gave money, enthusiasm and personal service. They were recognized as deaconesses, and at first had much power; and they took their full share of the fervours and martyrdoms of the age of persecution, and were counted in scores among the saints.

It is probable that the fact that women had this prominent place in the early church was one of the factors in its success. There were other and greater ones; but at the outset women contributed much to its triumph, and their status within it was clearly among the reasons. Later, as we shall see, they lost their important position. But even when their standing was at its lowest, and even in the darkest hour of



WOMAN WHO NURSED AN ARMY

Florence Nightingale founded modern nursing. After her work in the Crimea (1854-56) she devoted herself to the reform of hospitals and of the medical services of the Army and Navy, and the foundation of training schools for nurses.

From a photograph

Christendom, women were acknowledged to have souls, and it was only the doctrines of the Eastern religions which taught them that they could have no hope of being able to win salvation by their own individual efforts.

Little as is known about the women of the West, there is still less information to be gathered about those of the East. There have, after all, been many great women in European history, from Sappho, the poetess, to Elizabeth, Queen of England. Again and again through the centuries fate and character have combined to produce a remarkable figure in the person of a woman; a Catherine of Siena or of Russia, a Joan of Arc, a Maria Theresa or a Florence Nightingale. Few though they may be in our history, such women as these prove at least that it was not impossible for women to think for themselves and to act with firmness and vigour when the occasion arose.

The great writings of the West, too, reveal female characters of immense and forceful individuality. In the Greek drama, in Shakespeare and in all the realistic masterpieces of literature portraits of women are to be found, individual, powerful and interesting, obviously based upon a broad foundation of fact, and proving beyond question that the hampering con-

ditions of each age did not kill the possibility of women's development. Indeed, it needs no proof to assert that, low as was their status, and great as was their handicap, women, when they have been strong, have managed again and again to leave their mark upon their day and generation all over the western world.

Not so, however, has it been in the East. It is true that in the earliest settlements in India women seem to have played a full and noble part. The legends of the heroic age there, as elsewhere,

Ideas of Women show the wonderful and
in Aryan India fabulous female characters acting with energy

and decision and influencing the fate of the world in which they lived. Women in those early days probably shared in authority and in government, and strove and contended against the powers of evil; and it is possible that in the distant past when the Sumerians had developed a system of equality the Aryan-speaking people had something of the same kind.

By 1000 B.C., however, all this, if it ever really existed, seems to have been swept away. The Rig-Veda, which includes the collected legends of Manu, the ancestor of mankind, assigns to women a low and miserable place, and from that date onward they have had no 'status' at all. For it came to be thought that they were spiritually negligible, all but soulless, unable to survive after death without the virtue of man. With this faith to kill their hopes, and with all the imprisoning customs which gradually sprang from it, it was impossible that eastern women should produce any great outstanding figures.

When creating them, Manu allotted to women a love of their bed, of their seat and of ornament, impure desires, wrath, dishonesty and bad conduct . . . women are as impure as falsehood itself, that is a fixed rule. . . . It is the nature of women to seduce men in this world, and for that reason the wise are never unguarded in the company of females . . . a woman is never fit for independence.

This, with much more to the same effect, is the teaching of the Hindu scriptures, and on that discouraging basis Hindu women have had to build their lives.

The customs of child marriage, of widow hatred, of 'sati' and of the 'purdah' seem

almost natural in a society in which women's only importance lay in the bearing of sons. Perhaps the exposure of female infants was, after all, a kindness in a world where women were believed to be 'a great whirlpool of suspicion, a dwelling place of vices, full of deceits, a hindrance in the way of heaven, and the gate of hell.'

Buddhism and Mahomedanism overlaid the old teachings of Manu in many parts of India, but neither of these religions afforded relief to women. Buddhism, indeed, might have inspired a different ideal had not the original teaching been distorted by the old corruptions; and it is more than probable that the debased condition of women was one of the factors which prevented the full acceptance of the new ideas. Asoka, the great Emperor of all India, made provision in 264 B.C. for the education of women, in the hope of promoting the pure doctrine of the Buddha. But Asoka's great enterprises were too short-lived to correct the traditions of centuries, and the old superstitions choked them down.

Mahomedanism, when in its turn it rose and swept over the East, had a doubly depressing effect. For not only did it directly teach that women were soulless, mere instruments for the pleasure of men, but it established a fanatical worship of fighting, which in its practical effects was even more devastating. The triumphant followers of the Prophet, as they swept across the hills and the plains, branded the subjection of women deep into the hearts of the people, and their 'status' grew even worse than before.

Farther east, in China, things were no better, and the custom of crippling the feet of little girls, which was intended to keep them Chinese women helpless and ladylike, as ornaments reveals the attitude of the Chinese. It applied, of course, only to the high born and wealthy, but it was a true symbol of the condition of all the women in the Celestial Empire.

It is sometimes vaguely said that the position of women is a measure of the civilization of a nation, and the inertia and stagnation of the unchanging East are taken as its proof. Those who say this, as a rule, take too rosy a view of the freedom of women in the West, and attribute to their

own civilization a quality which it has, in fact, been very late in displaying. Nevertheless it may well be that there is some ruth in the suggestion.

Ignorant, retrograde and obscurantist women have necessarily been in Europe, they have at least enjoyed the free daylight and the society of their fellows, and have to some slight extent known at first hand the world into which they were born. But those of the East, poor servants of sex, have lived indescribably meagre and monotonous lives. Shut away in the darkest quarters of their houses, behind veils and barriers, cooped up in the continual society of one small group of companions, nourished on the trivialities of their restricted sphere, how could great people arise from among them? How could the children, even the male children, so nursed and so reared, reach out to the great movements of the world?

If civilization is to be judged by the status of women, then civilization has stood condemned for long ages; but its crime and its punishment alike have been most heavy in the East. It was from there, moreover, that the evil notions spread; and in the first few centuries of the Christian era the western world was inundated with some very remarkable notions about women which came to them from the hills of Tibet.

It was natural that in a society where the home was as degraded a place as it was in the East the mystic doctrine of asceticism should arise; and in fact it was known before it swept over the Christian world. The exaltation of chastity was but one of its forms, and not, indeed, originally the most prominent; but it was this aspect which became popular in the West, and at the very moment when the writings of authority had most power to guide the opinions of the faithful those writings became inflamed with a holy indignation against the very existence of women.

Women were told, with all the weight of a sacred authority, that they should be ashamed of the thought that they were women, and should live in continual penance on account of the curses their



MARTYR TO CRUEL TRADITION

Chinese women of the upper class long occupied a purely ornamental position in society; and their feet, like this lady's, were bound and maimed as a matter of course. Chinese opinion, however, has come to condemn the custom.

sex had brought into the world. The very phrases of Manu were used again; women were the door of hell, the personification of sin. Some even went so far as to maintain that their bodies were of diabolic origin, but this was decided to be a heresy. Yet, in spite of this concession, it must have been a discouraging time in which to be a female, even of the most hardy and energetic nature; and the brief moment of women's importance in the church was at an end.

According to the theory which inspired this attack, sexual passion was the most dreadful of all sins, was in fact the original sin which had caused the Fall of Man. Complete chastity was the highest ideal of life, and since the existence of women was a cause of temptation, women must obviously be accursed. Satan was exceedingly fond of assuming a female shape,

and hermits in their caves in the mountains frequently received his visits. The mere thought of woman, in short, was a danger, and the real creature was a misfortune.

So extreme and so unnatural was this point of view that human nature could not conform to it. People fell into the error of marriage, much as they have done in all ages, and the hope of bringing about the end of the world by universal virginity could not long survive against the instincts and habits of mankind. After a time the church was forced to recognize that the continuance of the race was not an evil. Although, as S. Jerome said, the sole argument in favour of matrimony was that it served to supply the world with virgins, yet it did so serve, and marriage came to be sanctioned and sanctified. Celibacy remained the higher state, the proper approach to heaven, and though the

innate sinfulness of being a woman diminished, traces of it remained—of which their exclusion from the priesthood and from any but the most distant care of holy objects remains to this day. Female saints persisted, even through the worst period, and, in spite of the inconsistency, they were highly honoured; but the ordinary woman remained, in theory at any rate, a somewhat deplorable mistake on the part of Providence.

The reactions of this theory upon men, and upon social and religious institutions, were, of course, far-reaching. Asceticism gave to sex an extravagantly important position, and the unhappy twist which the cult of celibacy gave to European morals was the natural result. There grew up a new hypocrisy, such as the old world had not troubled to practise, and at the same time the extravagant licence



MEDIEVAL CONCEPTION OF WOMEN AS THE DEVIL'S AGENTS

After the Eastern ideal of the strict maintenance of chastity had become influential in the Christian Church—during the early centuries of its existence—women came to be considered as wholly evil, since they inflamed men's passions. Regarded (officially) as servants or creations of the devil, they haunted anchorites and monks, either in the flesh or in image, to tempt them from their duty; above we see an orthodox but purely imaginary representation of the temptation of S. Anthony.

From the painting by Patinir in the Prado, Madrid; photo, Anderson

of medieval literature, and the squalor and degradation which have since then surrounded and accompanied prostitution

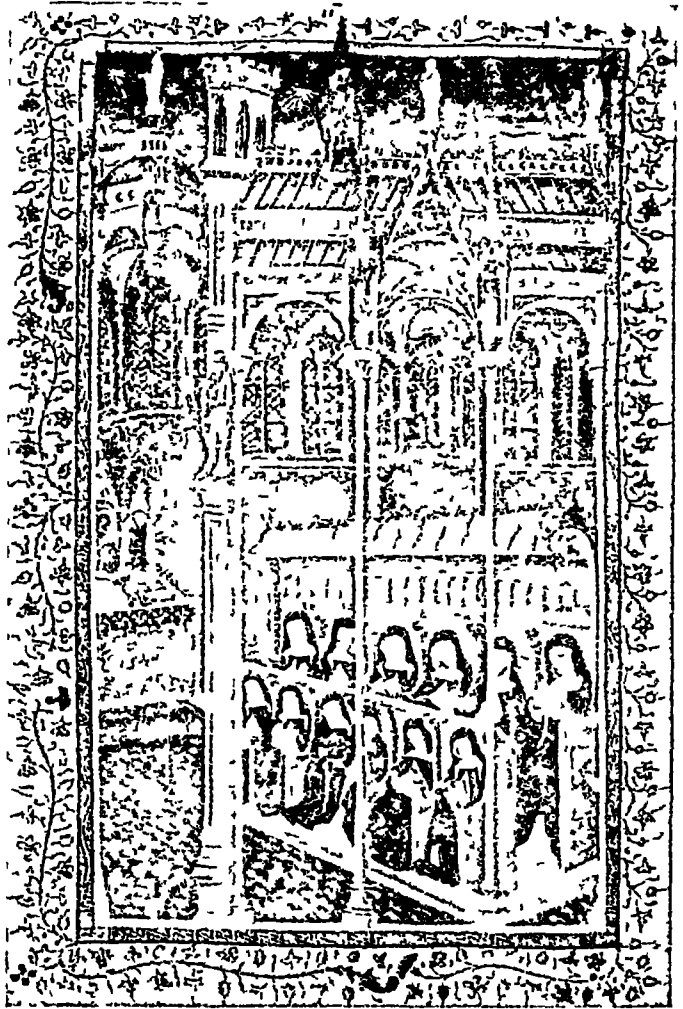
The results were, however, even wider than matters of morality, for the very structure of society was modified by the ascetic ideal

The outstanding feature of the Middle Ages, from almost every standpoint, was the development of the monastic orders. Had women been even moderately tolerated, and home life been even partially esteemed, we should not have had the non-military energies of centuries concentrated in the religious houses, and they would not have been in a position to preserve for mankind the learning and the traditions which led in the course of time to the Renaissance

Whether that learning and those traditions could have been preserved in any other way we cannot tell. If things had been different at any stage, all subsequent history would have altered, and it is idle to try to imagine what might have been. It is, however, certain that the growth of monasteries, in the world as it was, was a most fortunate thing, and amid the mass of evil which the status of women has produced it is agreeable to find one element of good

Even for the unfortunate women themselves the monastic orders were a great boon. Although many of them were very much limited to the nobility, the convents offered a dignified and interesting life to a number of unmarried women, and in their earlier days, at any rate, they gave scope to the talents and energies of women who, without them, would have led wretched and restricted lives

After a time there came a complete reaction from the ascetic theory, and in



ONLY CAREER ONCE OPEN TO EDUCATED WOMEN

During the Middle Ages, the religious houses were the only centres of intellectual culture for women. As nuns—these are Benedictines, from a psalter made in his youth for Henry VI of England—they could lead dignified lives, acquiring such learning as was available and ministering to the sick

From the British Museum

the Crusading times, although the convents and monasteries still flourished vigorously, the popular ideal was quite unlike that preached by the Fathers. A species of woman worship grew up which, in its way, was almost as unreal as the pseudo-ascetic fervour that had preceded it. It must, however, have had the effect of reawakening the self-esteem of women

The intense cult of the Virgin Mary was one of its symbols, and although, of course, Mary of the Immaculate Conception was so exceptional a phenomenon that she was set somewhat apart from ordinary womanhood, yet the honour

in which she was held had its influence in exalting motherhood. In daily life, among the nobility at least, there grew up the very singular theory that everything men did was inspired by women. Knights went out to battle solely for the love of ladies, while these same ladies lived and languished at their embroidery frames waiting for their lovers to return. One look from a pair of lovely eyes was considered reward enough for any toil.

Plain everyday fact was doubtless very different. Knights went out to seek adventure and to win renown, and ladies stayed at home to manage the estates,

to carry on lawsuits and to fill in their time with hunting, hawking and boisterous romping games. But the theory, the pattern of what was supposed to be the ideal, had, as it still has, great force. It brought chivalry into existence, and, with all its faults and omissions, chivalry was a considerable civilizing power. Although it was artificial and in great measure unreal, the fantastic worship of women which filled the romances and poems of the Middle Ages instantly altered women's position, and, absurd though it was, altered it decidedly to their advantage.

When theory is embodied in literature, and particularly in poetry and romance, it lives long and dies hard; and the theory of the time of chivalry which put women on so lofty a pedestal has hardly faded yet. The pedestal, in reality, resembled the shelf on which unwanted rubbish was stored; but both men and women believed it to be a place of honour, and congratulated themselves and took pride in their countries because of the high esteem in which the female sex was held.

There was another result of the spirit of chivalry which lasted for centuries, and which is still effective. After times had changed, and the parade and pageant of the Middle Ages had died away, there was left a shadow behind; and the outward manners of men towards the female sex date from that time. Behind the shadow, it is true, oppression was to become stronger than ever, owing to the economic changes of society, but through them all the fiction that women

were a sheltered and protected sex held firm.

Politeness and the symbols of outward respect have actually preserved something of the ideal of gentleness and generosity which the age of chivalry so highly extolled. It means little to the woman whose will is coerced whether her husband leaves the room before or behind her, but it may have some slight effect on the man; and the beating of wives certainly became less universal after the custom of kissing their hands was established.

These same manners, however, have had one distinctly unfortunate result. Because of them men have believed, in all sincerity, that the status of women was really superior to their own. They have felt that the act of uncovering the head in greeting proved respect and honour, and, looking on the surface of things, they have maintained that women were a highly favoured sex. The laws and customs and manners of mankind were believed to be arranged for their convenience, and there was nothing more which should or could be done.

'The disabilities a woman lies under,' wrote Blackstone in his famous Commentaries on the Laws of England in 1765, 'are for the most part intended for her protection and benefit,

so great a favourite is the female sex in the laws of England.' Yet

this favourite was denied almost every civil right, was shut out from education and from all but the lowest forms of wage earning, and surrendered her whole property on marriage. There was more truth in the words of the anonymous lawyer who wrote in 1737: 'Our old laws and customs relating to women are many of them very merry, though the makers of them might possibly be grave men.'

What effect all this unconscious hypocrisy may have had upon thought and behaviour it is difficult to judge. Every sham, no doubt, brings a corresponding retribution; but there are so many shams abroad in the world at all times that it is hard to isolate their results. Yet it is at any rate safe to say that the utterly false status of women which

prevailed from the end of the Middle Ages up to the end of the nineteenth century was not productive of good.

There was, however, one development which could not have arisen without this convention, and which played an important part in the shaping of history, and that was the French salons of the eighteenth century. It is doubtless too much to claim that the great revival of culture and intellect which is associated with the Académie and the Encyclopédistes was due to the women who entertained the great men of the day in their drawing-rooms; but still it is

It was not only literature and learning, however, which flourished in the witty artificiality of these gatherings; philosophy and political thought expanded in the same atmosphere, and the theories and speculations which led to the French Revolution took their rise in these hotbeds of conversation. Seated upon the gilded chairs, the great men decorated their new theories with epigrams, and launched them into the frivolous and sensation-seeking world; and, although they took no steps to put them into practice, and lived as corruptly and unscrupulously as those around them, yet they were



GENIUS, WIT AND BEAUTY GATHERED IN A FAMOUS PARISIAN SALON

That the great French hostesses of the eighteenth century were instrumental in encouraging original thought and fertilising scholarship is often overlooked. They made their drawing-rooms clubs—dilettante, artistic, philosophical or aristocratic—in which distinguished men and women met to exchange ideas, to appreciate intelligently and to criticise, over the tea-cup or wine-glass. Here we see one of the most brilliant of the aristocratic circles—that of the Princesse de Conti.

From the painting by Ollivier in the Louvre

certain that the existence of these regular and brilliant social meetings enormously stimulated the movement of thought.

The ladies who held the salons made no attempt to take a personal share in the movements they fostered; they wrote enchanting letters and fascinating memoirs, they said witty things and understood great ideas, but they were content to contribute only tact, flattery and sympathy, and to make an art of listening. From the warm sunshine of their hospitality such men as Voltaire, Rousseau, Diderot, Grimm and Gibbon drew encouragement, and the age of the salons saw the foundation of modern scholarship.

the founders of the new order. In a sense, therefore, the love of wit and the dread of ennui which animated Mme. du Deffand, Mme. Necker, Mlle. de Lespinasse and the rest contributed to the upheaval in which the democracy of the nineteenth century took its rise; and the status of women which made the salons possible, and which enabled these ladies to amuse themselves in so brilliant a fashion, deserves some acknowledgement.

Women themselves, however, profited little at first from the new regime which came into existence with the Revolution. Condorcet, indeed, supported their claims to a share in the Liberty, Equality and

Fraternity of the new dispensation, but such things were not yet for them. They took part, it is true, in the turmoil of blood and violence of the Revolution itself; they raged in the mobs, and put their necks under the guillotine; but their position remained unchanged.

The French Revolution, however, was the beginning of the woman's movement.

Although it seemed to do nothing directly, and although in the wars which followed women seemed of their usual irrelevance, nevertheless the abstract theory of human liberty had been accepted, and sooner or later its implications were bound to be perceived.

There was, moreover, at work in the same direction a factor that was anything but abstract, and that was industrial development. Under cover of the poetic idea that women were protected and cherished; the new method of production and distribution of wealth had been stealing away from them the few practical assets they had retained; and by the middle of the eighteenth century they had become, economically, the merest parasites in a world of men. And so useless and so unprofitable were their lives that a change became inevitable.

Industrial and economic developments have been profoundly studied from every

other aspect. We know a great deal about the rise and decline of guilds, of apprenticeship, of trade and commerce. The beginnings of factory organization and of Trade-Unionism, the invention of machinery and all the social adjustments which followed from it, have been carefully considered over and over again. But who has stopped to look at the position of women in relation to these things? Until the time when women themselves became scholars and historians no one remembered this aspect of affairs. Women meant sex; and what had sex to do with economics?

But women are more than sex, and the habit of forgetting this fact, and of thinking that their interests are amply provided for by the theory of superiority and the practice of domestic subordination, has resulted in a growing tangle of trouble, of which their anomalous status has been the direct cause.

It is impossible to describe here the decline of home industries and the rapid growth of a miserable sweated population which followed on it; but the subject is very important, and the part played in it by the economic helplessness of women is fundamental. Had their labours been recognized and their necessities been considered from the start, many of our present social troubles would have been



RETURN OF THE 'HEROINES' FROM THE STORMING OF VERSAILLES

Women were ever prominent in the mobs that exercised so considerable a political influence in Paris at the beginning of the French Revolution. Certain turbulent amazons, indeed, led and encouraged the armed horde that marched to attack Versailles on October 5, 1789; took part in the fighting at the palace; and, as depicted above in this contemporary print, returned in triumph

From the Bibliothèque Nationale, Paris

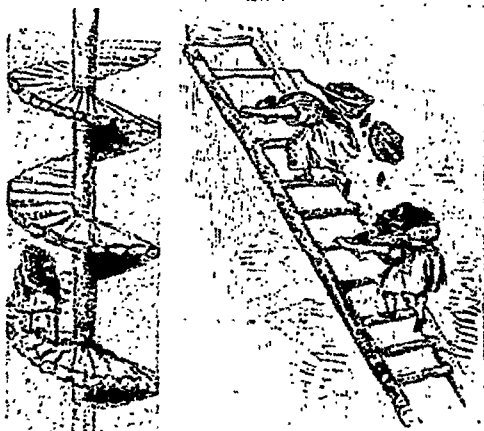
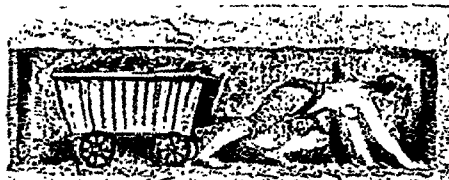
avoided. Housing alone is a sufficient example ; for, had the provision of homes been remembered when the factory system was first growing up, we might have a very different population living in industrial centres to-day.

The close of the eighteenth century and the early years of the nineteenth, which saw women in the lowest position that they have ever occupied in the West, saw also the rise of the women's movement ; and from the moment when they themselves began to seek to change their status, their condition improved. When it is studied in detail, the progress of women's emancipation seems very slow ; but, looked at in the light of all the centuries which had rolled by before it was seriously suggested, the agitation seems almost unbelievably brief.

The truth is, no doubt, that men's minds were ready for the change. Although the old prejudices found many apologists, and although, in Great Britain at least, the movement proceeded by small steps and without much logical sequence, the transformation which has come over the lives of women in two generations is almost fabulous. The change had its beginning in extensive education, and the rest followed after. The dramatic triumph which followed the Great War was but a hastening of what was already in sight.

And now we stand at the beginning of a new era, with nothing but the lost experience of ancient Sumeria as our guide. We are still a long way from a really free status for women, even in the countries where they are now politically enfranchised. Economic freedom is a good deal more difficult to secure, in our complex modern states, than any legal or political adjustment, and it may be long before it is attained. But we are, at any rate, steadily moving in that direction.

Even so, however, we cannot attempt to measure what effect the new status of women will have upon the civilizations of the future. We can theorise, even as our forefathers did, and assert that it will be an influence for good ; we can assume that it will make for peace, for stability and for greater humanity in our social institu-



SLAVES OF AN ECONOMIC SYSTEM

The severe nature of the work once done by women in coal-mines is here indicated. They hauled loaded trucks along low shafts and carried great weights of coal to the surface, ascending steep ladders or spiral staircases.

From Report on Employment of Women and Children, 1842

tions ; but as yet we cannot really tell. It may have less important effects than its advocates suppose, or be less beneficial than disruptive. But as regards one half of the human race it will at least be more enjoyable.

As regards the influence of the new status of women on the other half of mankind, and on the sum total of human beings we call society, we can, perhaps, predict that they will be in no worse circumstances than in the past. For, little as we know of the effects of the status of women in other ages, the merest glance tells us that it has hitherto hindered rather than helped the progress of the world. The new free-women will collaborate with men, and the world of the future will be their joint concern. Let us hope that it will be a more satisfactory place for the whole human race.

There may be some who think that this discussion of the status of women has missed the one essential point on which the whole question turns, namely, human nature. Those who still believe that women

are so conditioned by physiology and maternity that they require no development other than physical, may consider that all talk of their status is unnecessary.

Philippe de Novaire expressed this view very neatly in 1250. 'Women have a great advantage in one thing,' he wrote, 'they can easily preserve their honour, if they wish to be held virtuous, by one thing only. But for a man many are needful, if he wish to be esteemed virtuous, for it behoves him to be courteous and generous, brave and



WOMEN SHARE IN GOVERNMENT

Although there had been several remarkably successful queens of England, women were not supposed to be competent to fill the duties of administration in a democratic government until 1919, when Lady Astor (above) was elected Member of Parliament.

wise. And for a woman, if she be a worthy woman of her body, all her other faults are covered, and she can go with a high head wheresoever she will; and therefore it is in no way needful to teach as many things to girls as to boys.'

Even if this be the truth, however—which it is not—the status of women is still of historical importance. Just as slavery had its evil effects upon owners as well as slaves, and brought material as well as moral difficulties upon those states which upheld it, so the subjection of women has troubled the whole world. Whatever we may think in theory, we

cannot hope to understand the past—or to live in the present—without remembering women. 'Had kind nature allowed us to exist without the help of women,' said Metellus Numidicus to the Romans, 'we should be delivered from a troublesome companion.' But kind nature has not so ordered the world, and if we wish to understand it, we must examine the actual importance of the lives, occupations, liberties, responsibilities and limitations of the female population at different stages of our history.

We must do more than this—we must try to estimate how their condition has affected women themselves, whether it has pleased or distressed them, developed or thwarted them, and what contributions it has enabled them to make to the sum of human wisdom. And even that is but one half of our task. To complete it we must examine the effect which their position has had on men, and on the groups and civilizations in which they were living; must see whether the special treatment of women in different ages helped or hindered or was irrelevant to the march of science, learning and art. We must find out whether, because of it, women were more or less helpful to their fellows, more or less fitted for the care of the young; and we must notice whether their status tended to keep social institutions stationary, or to break them up into new forms; whether, in short, it helped or hindered the slow development of mankind.

This is undoubtedly a large task: The first part of it alone requires a re-examination of every race, at every period of its history; and the second requires a complete shifting of our normal historical point of view. But if we are to read the past rightly we must, sooner or later, undertake it. For, just as in the life of an individual the influence of sex is subtle, intimate and far-reaching, so it has been in the life of the race. Men and women have shared together the habitable earth; they have constantly acted and reacted upon each other, and have brought into existence the world we know to-day. We cannot understand it truly unless we examine that special hidden history of women which, only now, is beginning to be thought worthy of serious historical research.

HISTORY'S ECONOMIC BACKGROUND: A NEW FIELD OF STUDY

Showing the Influence exerted by essentially Material Forces on the Trend of Politics Conduct and Morals

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THE causes of historic events lie secreted in economic systems. Men live by work. What they do determines what they think and are. Their lives, for the most part, are a necessary function of the economic position that they occupy. Their hopes and fears, their duties and possibilities, are mainly set by the prospect opened to them by their situation in the productive system.

The ideals of an age, its spirit and its fears, are, in their turn, simply the expression of what the economic organization permits to those who live by its operations. The apparatus of mind is, accordingly, essentially an expression of the way in which, at some given period, we earn our living. Our effort to shape the events of our time is most clearly interpreted by the study of the economic forces which limit and liberate the prospect we confront.

Other explanations of historic phenomena are as various as the writers of history. The effort of Providence, the influence of great men, the work of race, the impress of nationality or religion—these are but the most obvious of the many idealistic hypotheses that have been put forward. Many of them have merits that give them at least the right to consideration. It is clear, for instance, that the personality of Cromwell shaped the events of the Puritan Rebellion in a special fashion; and it is no less undeniable that the hold of religion upon men's minds, in the Middle Ages very notably, has been powerful in determining the ideals and institutions under which they have lived.

Yet no idealistic thesis can be final in any decisive way. Cromwell would have remained a quiet country gentleman but

for the situation which evoked his military and administrative genius; and there have been periods and countries, the United States in the nineteenth century for example, where the influence of religious conviction has not been of widespread importance. All theories, in fact, which trace back the causes of events either to men or to ideological systems cannot avoid being merely what may be termed intermediate explanations; for they do not show why the man or the idea had the opportunity to be influential.

It is this defect which has tended, especially in the last two hundred years, to throw the balance of opinion on the side of materialistic theories. Montesquieu and Buckle, for instance, emphasised the importance of climate; and if much of what they had to say appears to us now as exaggeration, it is clear that climatic difference between East and West, especially in **Material theories of History** the early history of mankind, has been of decisive importance. Yet climatic change explains differences only over vast epochs and great areas; if we seek to know why there is so great a difference between the history of England and that of Spain we must, clearly enough, look to other sources for a response.

In the last eighty years, and especially as a result of the development of socialistic ideas, there has been an increasing tendency towards what is called the economic interpretation of history. This, broadly speaking, may be summarised by saying that the main factors in historic development are those which, at any given time, underlie the production, distribution and exchange of wealth. These explain the

ideas, institutions, beliefs, desires which make themselves felt in each epoch in history.

In the organization of production, it is argued, men enter into a system of relationships out of which all other aspects of social life, political, religious, moral, intellectual, necessarily grow. The first need of Man is to satisfy his economic wants; it is natural, therefore, that the system of production should be the basis of which all else is the superstructure. Therefore the nature of every society is most largely determined by reference to that foundation.

The method of production and distribution will determine, accordingly, the division of society into classes and the manner of distributing

Economics and wealth; and other changes
Class distinction will occur, not because men change their views, but because a different system of production and distribution leads them to regard differently the views they once held. Conceptions, accordingly, of right and justice, liberty and equality, are always relative to the given system of production which prevails.

The realization, of course, that the economic factor is of vital import as an explanation of historic change is not a socialistic discovery, but is as old as political philosophy itself. Plato's communism is the response to his conviction that the influence of private property is fatal to the well-being of society. Aristotle did not go so far; but he, also, was insistent that the forms of government are a function of the distribution of wealth in a society.

In more recent times, the central feature of Harrington's *Oceana* was his insistence that, whatever the forms of the state, political power will be, in fact, the handmaid of economic power. James Madison, one of the chief architects of the American Constitution and the fourth president of the United States, urged with immense ability that political systems are always built upon the manner in which wealth is divided in the state. The classical economists, like Adam Smith, the Utopian socialists, as Saint-Simon and Fourier, made good and evil in the com-

munity a function of the prevailing method of production.

The difference between them and Karl Marx, to whom the vast influence of the theory in recent times is due, is twofold. In the first place, Marx gave this view a rigour and emphasis of statement which it had not before received; and, in the second, by linking it with his theory of class war, he made the economic interpretation of history a basis for a prophecy about the future course of historic events. Thinkers are still in profound disagreement whether his inferences from the general theory are correct; but its truth as an efficient cause of development is now accepted by most historians with pretensions to scientific analysis.

The theory is perhaps best explained less by deductive and abstract statement than by a series of illustrations of the way in which it may be applied. It is now realized, for instance, that the great change in society which we call the advent of civilization was made possible for mankind by the invention of agriculture (see page 217). We do not, of course, know either the date or the manner of this seminal **Changes wrought** discovery in the history **by Agriculture** of Man; but it is easy to see that as a consequence of this change in economic habits large changes in social arrangements must have resulted. Mankind came to realize the value of labour, since men would be required to till the ground and tend the crops. Slavery probably arose, at a slightly later date, from the habit of no longer killing captives taken in war, but of forcing them to labour for their captors.

It is obvious, also, that the coming of this agricultural stage would lead to a great increase in population; for it would at once increase and make more certain the supply of food. Clearly, too, it was at this period that the ideas of profit and capital were born; to set seed apart for next year's sowing is to increase your crops. The idea of postponement of consumption results in greater benefit to the owner. In these respects it is beyond discussion that new habits of production produced a gigantic revolution in social organization and intellectual ideas.

Primitive society was based upon kinship; the territorial state was not yet known. Its advent was due to the increasing importance of private property in a society which only discovered by degrees the permanent differentiation of ranks and classes which its possession came to imply. Primitive society is built not on territorial, but on personal union; a member of the tribe is of the blood of that tribe. It is, moreover, exclusive. It does not, like the territorial state, search for strength in terms of increased population. It is, finally, communal and non-competitive in character. The individual does not live by choices he can make; his duties are largely prescribed for him. The real unit of primitive society is the tribe itself, and the individual, however important, is a bondman in its service.

Probably as a result of increasing population, and of a consequent pressure on the means of subsistence, there develops the habit of war; and the more a tribe grows rich, whether through agriculture or the progress of arts and crafts, the more it develops the habit of fighting.

For riches at once prompt the instinct of defence in the possessors and of attack in those less fortunately situated. We can see from the history of Anglo-Saxon England how its wealth tempted invaders from overseas. These settled down and sought by consolidation of a definite territory to repel further invaders like the hosts of William the Norman.

Little by little the territorial bond supersedes the racial bond, especially when, as in Norman England, the conqueror is of different race and speech from his subjects. The state becomes built on the military power of its ruler over a definite territory. He requires the means of controlling within and without that territory. He builds up a system of allegiance on the tenure of land held in return for service. The customs of his subjects become privileges which the force at his disposal enables him to confirm or revoke at pleasure.

The state creates a feudal society as the bond of transition between the family

and politics. Partly it is personal; partly, also, it is territorial in character. That is because it represents a series of compromises between forms of social organization which aim at different purposes. And those compromises are marked by struggles between the old and the new, which show how the dissolving communal bond, as it meets the individualism of the new order, struggles eagerly to survive.

Political society, in other words, is very largely marked in its emergence by a struggle between classes. It is a conflict between possessors and those who have nothing. The early history of Athens is full of such struggles. Solon's cancellation of mortgages and prohibition of enslavement for debt was an effort by legislation to prevent a class verging upon the danger of slavery from revolting against its oppressors. His division of society into classes determined by the property they held was at once an effort to give property its special authority while preventing the danger that the poor might become politically insignificant (see further under Chap. 36).

His mistake was in not realizing the growing significance of commerce; and his attempt was only partially successful. Yet it is important because, like the later attempt of Cleisthenes, it showed how the political system of ancient Greece was built upon differences determined by the ownership of property. Ancient Greece could never reach a basis of unity because its division into citizens and slaves meant a continuous competition of petty principalities, internally for order and externally for conquests, which would mean provision for the greater wealth of citizens. The city states began to enslave each other; and imperialistic war so weakened them that they became the helpless prey of the foreign conqueror.

The history of Rome is not, in essence, a dissimilar one. There, also, we have economic interests largely determining political constitutions. The reforms of Servius Tullius, like those of Solon, were the outcome of a realization that class antagonism was threatening the security of the state. The purpose he had in view

Conflict between
Rich and Poor

Riches an incentive
to Warfare

the instinct of defence
in the possessors and of
attack in those less fortunate

was to achieve stability by centralising military and political power in the hands of the owners of property. And the army became a definite method of adding to the wealth of the state.

This policy entailed a struggle for the plunder of conquest in which the antagonism of patricians and plebs determined the nature of political organization. It is significant, for instance, that the Licinian law, which sought to prevent a patrician monopoly of land, was put into operation only when the help of the plebs was needed to repel an invasion from Gaul.

It is significant, also, that Spurius Cassius was killed for his effort to distribute land among the poor; and the tragedy of the Gracchi was an attempt to control a system which destroyed the chance of common interest between rich and poor. (See Chapters 55 and 62-64.)

The ultimate catastrophe in Rome came, if it came from anything, because the unnatural accumulation of property in a few hands meant a state always threatened by internal disorder. This meant fabulous efforts at state maintenance to buy off the rebellion of the poor; and a great standing army which ultimately became the master of its masters. On the unstable basis of militarism and slavery the Roman state lacked all unity of purpose. Its masters were degenerate because they had ceased to depend upon themselves; the slaves had no common interest with them. The barbarians who had knocked so long at the gate of Rome had in the end no difficulty in overthrowing its power.

Historians have speculated as to whether Christianity might have revived the declining authority of Rome; but the answer surely is that it never had an opportunity. The Christian Church began as a religion of the disinherited built upon a belief in the virtues of poverty. To the Roman it was a secret society incompatible with allegiance to the empire. Had it sought to challenge the structure of Roman society in its beginning, it would inevitably have perished.

But Christianity developed doctrines which enabled it to make its compromise with the world. Instead of the vague

communism of its beginnings, we find a doctrine of stewardship which the rich apply for themselves; instead of the abolition of slavery, we find an insistence that since all men are equal in the sight of God, slavery is an unimportant and external thing. Christianity, accordingly, finds its place within, and not without, the Roman social system; and after Constantine left it the official religion, its own propertied interests made it a pivot of feudalism.

That is, indeed, one reason why the Reformation became necessary. The growth of commerce had created needs incompatible with the restrictions of feudal society. The merchant and the manufacturer were the types of an individualist society; feudalism was built on a partially communal foundation. The instruments required by industrial society were condemned—as usury, for example—by the dogmas of the Church; and Protestantism permitted an individualist creed to develop a system more suited to the landless middle class owning industrial capital.

It is, moreover, interesting to note how much of medieval ecclesiastical practice is illuminated by its economic origins. The Church obtains the control of wills in order to see that no man dies without leaving to it a due share of his property. Pope Gregory VII introduced the practice of celibacy largely because the habit of clerical marriage tempted priests to provide for their families from the possessions of the Church. The plea of S. Francis for a return to apostolic poverty was evaded by a system of holding property in trust for his order; and those who stood by his principles actually suffered imprisonment and outrage.

Even the Crusades became largely a commercial adventure; and things like indulgences became less a religious practice than a source of profit. It is also very striking to note how medieval sects which, like the Béguins and the Beghards, sought a mitigation of the economic regime were stigmatised as heretics; the Church, which was the largest property holder, not unnaturally resented attacks on her foundation.

The Reformation released a system of dogmas curiously favourable to the new needs of commerce and industry. It is with the Reformation that the capitalistic spirit began to dominate the Western world; and it is significant that this spirit, which makes gain and labour ends in themselves, is the spirit liberated by those who derived their ideas from Calvin. We cannot overestimate the importance of the fact that at a time when new capital was urgently needed to finance the great expansion of commerce, a religion arose which, by its insistence upon the duty of asceticism, made possible the accumulation of the wealth which financed that expansion. Wherever there was a Calvinist centre, as in Holland, Huguenot France and Geneva, there was also to be found the capitalist spirit in its fullest expression. It is difficult to avoid the conclusion that the main reason for the acceptance of Calvinism was its responsiveness to the economic needs of the time.

Nor must we omit to note that economic factors largely explain the success of the Reformation in England. The Roman Church was unpopular by reason of the money it drained out of the country; so far back as the reign of

Why the Reformation succeeded Edward III the Statutes of Provisors and Praemunire are an official protest against its exactions. The Reformation was built in part upon the abolition of these exactions; in part, also, upon the fact that Henry VIII used at least one-quarter of the confiscated monastic possessions to endow a new territorial aristocracy. Thereby he bought the support of men for a regime which, otherwise, might have aroused grave doubts in their minds.

And when the nation, as in the reign of Elizabeth, had to protect itself against the onslaught of Catholic Spain, no small element in the rivalry of these powers was a struggle for commercial supremacy. The feudal motive for war gave place to the national motive; and, as early as this, the main element in that nationalism was a search for monopolistic markets (such as colonial possessions) whereby the nation might acquire power through wealth.

Economic considerations, moreover, very largely explain the rise of toleration in religious matters. A diversity of persecuting religions led to an epoch of religious wars; between 1559 and 1594, for example, France was nine times harassed by internal conflict. Every sort of idealistic justification for tolerance was urged. As a faith built on love, it was argued that Christianity was incompatible with persecution; it was insisted that intolerance does not produce sincerity; it was denied that the Scriptures justified the use of the sword. But what really persuaded men of the folly of persecution was the fact that it did not pay.

Men pointed out that the state should not perish for religion's sake; that Holland, where toleration prevailed, was the most prosperous of European states. In England writers were not wanting to point out that persecution of dissenters from orthodoxy meant bad trade and unemployment. There arose parties to argue that the state could not deprive itself of the services of energetic citizens. The flight of men to the New World, the economic loss of such criminal follies as the repeal of the Edict of Nantes (1685), all enforced the same lesson. The decline of Spain, whom religious persecution deprived of thousands of her ablest subjects, served the rest of Europe as a warning and an example.

Idealistic arguments undoubtedly aided in the enforcement of political neutrality in the face of religious variation; but it was not until the cost of religious unity had been tested by experience of conflict that idealism was found acceptable by men of differing views.

The great political fact of the seventeenth century in England is the transfer of power from the Crown to the House of Commons. The effort of the Stuarts to repeat the success of the Tudors and keep Parliament in leading-strings broke down. The explanation of the Rebellion is, of course, a complex one; religious strife, royal misgovernment, hatred of a foreign dynasty, are all factors that played their part. But the essence of the conflict was an economic one. It was a desire on the part of

men who had the wealth of the country in their hands to obtain the mastery of the state by the control of the taxing power ; in part, also, a protest against Crown regulations which subjected trade at every turn to outworn restrictions.

The merchants who sided with Parliament genuinely desired freedom and equality ; but no one can fail to see that, for them, implied in these ideals were freedom from economic interference, by monopolies and the unjust distribution of

Power deserts Crown and Court taxation, and equality in religious status where its absence meant financial penalty and not seldom imprisonment. The Great Revolt, in other words, means, clearly enough, that the incidence of economic power in the state had shifted away from Crown and Court ; and the incidence of political power was altered during the seventeenth century to suit the new balance.

It is worth while noting in some little detail how greatly the forces in the English political struggle of the seventeenth century were ultimately economic in character. Charles I failed because the superior economic forces were against him ; William III succeeded because the superior economic forces were on his side. Parliament won against Charles because of the financial power of the City of London. The merchants found the money to pay the wages of the Navy and thus to prevent a blockade of the Thames ; this, in its turn, at once preserved the commercial security of London and safeguarded the Roundheads against the danger that the Royalists would obtain arms from the Continent.

Not less important is the fact that the riches of the Puritan merchants consisted mainly of commodities and rendered it relatively simple to raise loans ; but the king depended on the landed estates of the Royalists, which could not, with the same facility, produce money. Anyone who takes the list of complaints against Charles, the terms, moreover, on which a settlement might have been had, will be impressed by the degree to which they imply an economic basis. The victory of Parliament was the victory of landed gentry who had made their peace with the

merchants through the grant of toleration. Constitutional monarchy was established in England because absolutism was incompatible with the new order which had risen to economic power.

The result in the seventeenth century was to put the Crown in fetters ; but the basis of political representation was still the possession of landed property. This did not make much difference until the great epoch of industrial invention in the latter half of the eighteenth century. Its result was an enormous expansion together with a consequent and coincident growth of population in the towns. There developed, accordingly, a struggle between agriculture and industry for the control of Parliament.

The merchants of Manchester and Birmingham demanded equal place there with the squirearchy that had dominated it. The Reform Bill of 1832 transferred political power from the squire to the merchant ; therein it merely reflected a change in economic power which had already taken place. And it is striking that the advent of the middle-class industrialist to power in the House of Commons should have been followed by a series of statutes built upon the interests for which he desired a place. The Navigation Acts are ended ; the protective system is brought to a close ; laws which operate to limit freedom of contract are, similarly, repealed.

The advent of the middle-class industrialist to political authority produced a legislative record which at every point reflected **Middle Classes** its belief that its needs **dominate Politics** were universal ideals. It was interested in religious liberty, political democracy and the destruction of the privileged position of the landed interest. But it showed no understanding of the problems of economic democracy because the latter had no relation to its wants.

The chief Factory Acts, the Franchise Reform of 1867, the full recognition of trade unions in 1875, are all of them the work of a Tory party predominantly agrarian in character ; and these were given, less on grounds of objective justice, than because Disraeli, their chief author, saw in such measures the opportunity of

winning industrial working-class votes against his rivals, the Liberals; exactly as, in his turn, Gladstone enfranchised the agricultural labourers in the belief that they would reward him by voting against the landed interest.

In few realms of modern life has the influence of the economic factor been so striking as in the movement for the emancipation of women. There is a sense in which feminism is as old as political philosophy itself; for the cogency of Plato's protest against a world which excludes women from government has never been surpassed. Mary Astell and Mary Wollstonecraft in the eighteenth century, John Stuart Mill in the middle nineteenth, made an intellectual case for their cause which remained unanswerable. Yet they hardly brought conviction to minds steeped in the prejudices of an earlier system.

It was not until industrial change made the economic activities of women so normal a feature of social life that its recognition was inevitable, that the barriers were overthrown. Then occupations to which entrance by women had been thought impossible were thrown open. The stenographer, the mill-hand, the shop-girl by mere numbers made political enfranchisement inevitable;

and their right to protect their economic interests implied the recognition that the bar, the legislative assembly, even the police force, could not be closed to them any longer. Where fifty years of argument were unavailing, the necessities of war revealed how enormous was the place of women in economic life; and men who had, until then, remained unmoved by every appeal, found themselves unable to resist the implications of the spectacle which war merely made dramatic.

Nor must we miss the influence of the economic factor in the working of legal systems. It is clear that a large part of any corpus of legal doctrine will reveal the pressure of economic interests at some given moment particularly influential. Things like the English game laws bear clearly upon their face the interests of the dominant squires who made them. Rules

like the common-employment doctrine in the Common Law would never have been manufactured by a society in which trade unions had been powerful.

English trade-union law itself, indeed, bears upon its face the obvious effort to serve a shifting economic interest. The urban artisan was enfranchised in 1867. In 1871 Gladstone, who drew his political strength very largely from the commercial classes, was compelled to grant the trade unions a very partial measure of legal recognition; but his dependence upon business

interests made him unwilling to grant what the trade unions were seeking.

Disraeli, who relied mainly upon the support of agricultural interests, in which trade-unionism was hardly existent, lacked the handicap by which his opponent was burdened; and the Trade Union Law Amendment Act of 1875 was intended to buy the support of the artisan voter.

His work was destroyed by judicial interpretation in the famous Taff Vale case; and no small part of the Liberal victory of 1906 was due to the willingness of that party to placate trade-union indignation by promising its repeal. Nor is that all. It is not in any way fanciful to regard the Liberal adoption of measures like the Employers' Liability Acts and the Workmen's Compensation Acts as efforts to prove to the working-class voters that, equally with the Tory party, Liberals were prepared to recognize and not to resist the economic claims of trade-unionism.

In this connexion, another fact of significance may be pointed out. If we analyse the occupations of members of the House of Commons during the last hundred years, it is very striking to note how the emergence of new economic interests is reflected there. In 1832, in either party, it is dominated by landed proprietors. As the effect of the Reform Acts makes itself felt, these give way to the representatives of commerce and industry. But these do not imply a united front. In the thirties and forties, the largest single group of business men were the textile manufacturers, then the dominant class in the industrial revolution

which was proceeding. In the next two decades railway directors took their place, and that is, par excellence, the railway age; in the 'seventies and 'eighties they, in their turn, were replaced by the manufacturers of iron and steel. In our own day, the manufacturer has given place to the financier; and the largest group of business men in the House of Commons to-day represents, not a special technique, but the power which directs the flow of industrial finance.

Nor is that all. So long as the two great historic parties represented respectively land and industrial capital, there was no need in the state for a party especially representative of the interests of the wage earner;

Land and Capital
versus Labour

he was protected by the necessity incumbent on Tory and Liberal of bidding for his support. When, for instance, Keir Hardie founded the Independent Labour Party in 1893 few believed that it had any future; in 1906 the most eminent American observer of English politics predicted that its natural destiny was to be an appendage to the Liberal Party.

But, as the last years of the century came, the situation changed. The Tory party, for a variety of causes, ceased to be mainly a party of the land. Manufacturers who felt the stress of foreign competition were attracted to it by its programme of protection; others joined it who found the collectivism of the Liberal party incompatible with their predilection for a policy of *laissez-faire*. By 1906 it is fair to say that an economic analysis of the two parties would not have revealed any striking differences in the interests they could have claimed to represent. And it is significant that from 1906 onwards can be traced the growing differentiation of Labour from Liberalism.

The experience of the war-years completed that process. It showed that there was no permanent hostility between Conservatism of the modern type and the Liberalism of the modern business man, once the special problem of Ireland was taken from the field of controversy. To some extent, differences upon tariff reform maintained a basis of division; but it is notable that the pledge of Mr. Baldwin in

1923, not to proceed with a tariff policy, broke down the barriers between the historic parties. Their differences became expressible in terms rather of persons than of ideas. For any division built upon the latter, it was necessary to go to Labour.

It would be possible to trace a similar system of operating causes elsewhere. But it is, perhaps, more useful to point out other phenomena in which the economic factor has been significant. Our thesis is, broadly, that economic power precedes, and makes a dependent of, political power; that the institutions through which the latter expresses itself will be influenced to serve the economic interests which are paramount at a given time. The history of the American colonies is very striking in this regard.

Until 1763 they were dependent upon the naval and military forces of Great Britain for their support. The presence of France and Spain to the north and south meant not only the prospect of their possible subjugation, but also that the new land to the west might be the territory of an alien empire.

For that reason they accepted the mercantile colonial policy of Great Britain with no great difficulty. Their legislation and their governors were fixed for them in London; and only one or two observers of special insight, like Harrington in England and Turgot in France, were bold enough to prophesy their ultimate independence.

But the peace of Paris in 1763 freed them from the nightmare of foreign domination. Thenceforward it was certain that the complexion of North America was to be neither French nor Spanish. Thenceforward, also, the colonies did not lean on Great Britain for military support. It is precisely at this moment that impatience of the commercial restraints of Great Britain began to manifest themselves. The import of that impatience was not perceived; and George III and his ministers sought to prevent response to what it implied. Their blindness evoked protest, and protest evoked revolt.

The recognition of American independence in 1783 was simply the admission

that the economic power of the colonists had by then become integrated enough to determine its own form of government and policy.

Similar considerations explain the federal movement in politics from 1787 to our own time. The removal of British suzerainty over the American colonies left thirteen distinct and petty sovereignties, each with ultimate power over its own destiny. But the problems of tariff barriers, and the need for settling the debts of the war, were too urgent to make independence profitable. Similarly, Upper and Lower Canada were racially and religiously distinct; but the need of a railway across the Dominion triumphed over these seeming incompatibilities and confederation was achieved in 1867.

The history of Australia is not dissimilar; it was the need for a unified policy on railways and foreign commerce that brought the six states into a single commonwealth. German federalism is, if in a less thoroughgoing way, the history of the triumph of commercial need over a historic tradition of separation.

Since the 'seventies European history has been a record of rivalry between the great powers. It is notable how largely that record must be interpreted in economic terms. The British occupation of

Egypt was essentially an economic adventure which sought to protect the interests of traders and investors. The race for Africa aimed at access to raw materials necessary to manufacturers in European states. The penetration of China and the establishment of the treaty ports was an effort to provide a safeguard for the European business man developing his commercial market.

No people has been more vehement in its protests against imperialism than the Americans; but their annexation of Texas and their virtual suzerainty over Haiti, San Domingo, Nicaragua and Colombia have all been the result of a desire to protect their nationals who have developed investments there. America, indeed, has become as definitely imperialist as any of the European peoples by the simple fact that its accumulation of

capital has made possible the export of wealth to comparatively backward countries.

Perhaps the most striking instance of all is the American relationship to the Philippines. There, a coming independence has been constantly announced. But the larger the volume of American economic interests in those islands, the more determined has been the protest against any abandonment of the present protectorate. Every American policy kind of reason for its in the Philippines continuance, strategic, moral, political, has been advanced. Even those who, among Americans, most earnestly criticise the British regime in India, have had no difficulty in assuming that American control of the Philippines is a trusteeship of a qualitatively different kind.

The truth, of course, is that a relationship, which begins as economic, develops upon that foundation a superstructure which conceals its origins; and those who have an interest in maintaining it become blind to the purposes that they are destined, but half-consciously, to serve.

Modern imperialism, in a word, is decisively an economic development; were that factor to be abstracted, it would be without meaning. And the way in which it shapes to its own wants the situations it encounters is singularly fascinating. Europeans in Africa are incapable, for physical reasons, of manual labour. They find there native races who are satisfied with their primitive surroundings and have no desire for the benefits of civilization. But native labour is essential to European settlement. It is then discovered that native laziness is bad for the African. He is taxed in order to compel him to work, and a criminal jurisprudence develops in which the most serious offence is the desertion by the native of the labour he has contracted to perform.

Law and morals, in short, seem in tropical climates to be essentially a direct function of the economic needs of white settlers. Just as we noted earlier that the invention of agriculture produced a revolution in the habits of primitive man, so the introduction of industrialism into the tropics alters completely the habits

and standards of the native. He can no longer suit his habits to his wants. These are transformed by the necessity of suiting his wants, first of all, to the economic needs of the system that the white man brings.

The process of adjustment is, of course, difficult and painful. But they are in grave error who attribute these qualities to some inherent defect in the white man. What he is doing there he cannot help doing, simply because any economic system will shape the ethical system in terms of the resulting necessities.

The observer who seeks to account for historic changes is, indeed, almost bewildered by the wealth of illustration which their economic analysis affords him. A single factor like the inflation of currency in post-war Europe may change the relative position of social classes in decisive fashion. The appeasement of belligerent enmity is very largely born of the necessity to reconstruct suspended commercial relationships; men cannot trade together and still remain in a permanent posture of hostility.

So, also, the changes which have taken place in the Russian state since the advent of the Bolsheviks to power have been born, not of ideological dispute, but of grim economic need; facts like the want of capital and the need to placate the peasant are more powerful than a hundred

Changes in Bolshevik Russia abstract dogmas. Nor should we omit the influence upon American labour of the restrictions upon the immigration of Europeans. That has created something akin to a monopoly for skilled labour which, in its turn, has altered the standard of working-class life in a fashion which represents, for good or ill, a definite, if silent, revolution.

For it has created standards of consumption at a higher level than in any period of history; and it is one of the obvious lessons of the record that men will not easily abandon without conflict gains of that kind. Those standards of consumption have, in their turn, enormously increased the volume of American productivity, and this, in the perspective of the American protective tariff, has

developed domestic manufacture at a phenomenal rate.

As a consequence, there have been grave repercussions on Europe. For the Allies owe America the millions they borrowed in the war. They can pay only in goods; and the American tariff wall keeps out their goods. The transfer of the debts to America has, as a result, become a problem of formidable dimensions. It is hardly too much to say that it has, in conjunction with the natural wealth of America, made her the decisive factor in the world politics of the new epoch.

We must, of course, guard against the facile temptation of making the economic interpretation of history the exclusive explanation of events.

If, as is here urged, it is the master key, this does not mean that there are not other keys also. **Economics are not the only key** Economic factors are still largely helpless before the passionate nationalism of the Balkans. There are hundreds of thousands of working men who place the call of the Roman Catholic Church before the demands of the working class to which they belong.

We must, moreover, remember that if economic systems produce ideas and culture, ideas and culture have, in their turn, their reaction on economic systems. The explanation of Luther's success is partly economic; but there are also elements in that success which have no relation to an economic interpretation. The passion for equality, Marx himself once said, is a decisive fact in the modern world. Obviously that passion is in part a response to economic need; but obviously in large part it transcends it.

Yet when the last word has been said in criticism of this view, it remains the most suggestive clue to which the historian has access. It enforces, moreover, a lesson as important as any we can learn. If the root cause of change is economic, the urgency of justice in economic arrangements is vital if that change is to be made in terms of peace. The discovery of what such justice implies is, it may be, an arduous and difficult adventure. Certainly there is nothing to the understanding of which it is more necessary to bend our energies.

THE CONCEPTION OF EMPIRE: HOW IT HAS MOULDED HISTORY

The gradual Expansion of the Imperial Idea traced
through its various Manifestations in Human Record

By Sir JOHN MARRIOTT

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EMPIRE, Emperor, Imperial, Imperialist—these are terms which in some minds carry, we must confess, an unpopular, not to say a sinister, connotation. To such minds, Empire is synonymous with aggressive war and conquest, with indiscriminating lust of territory, with autocracy and its correlative servitude; an Emperor is a despot; an Imperialist is identified with a 'Jingo' or a 'Chauvinist,' with tinsel, bombast and vulgar ostentation of power. But the common connotation is not wholly justified in historical fact.

Etymologically the words are all connected with the Latin word 'imperare,' to command. Forcellini defines 'imperium' as 'auctoritas quam habent dominus in servos, pater in filios, maritus in uxorem et hujusmodi'—the power of a master over his slaves, a father over his sons, a husband over his wife and the like. But Forcellini (1805) was evidently neither an ancient nor a modern. Imperium was originally the right possessed by a Roman magistrate to employ force to secure obedience to his orders.

The right was conferred by a Lex Curiata indifferently upon kings, consuls and praetors; it included both military and civil authority, though generally the magistrate was authorised to exercise civil jurisdiction only within the walls of Rome. In time, however, the imperium came to be specially identified with military command and proconsular administration. From the moment the general took the field he was saluted as Imperator, and after a victory the troops were wont collectively so to acclaim their commander; but under the Republic the title, it is

important to observe, was invariably laid aside on the lapsing of the imperium.

The title was borne by Julius Caesar continuously during the last fourteen years of his life, and with complete legality, since he was vested with the imperium successively as proconsul, consul and dictator. In his case, however, as in that of other magistrates of the Republic, the word followed the name as a title. Augustus significantly adopted it as a 'praenomen' or personal name, and though the next three Caesars did not follow his example, Nero and his successors adopted the 'praenomen imperatoris.' Gradually, as Strachan-Davidson points out, 'the proconsular and military associations connected with the words imperium and imperator fall away,' and by the time of Domitian, if not earlier, the word had become a distinctive emblem of the supreme power.

The words derived from imperium have all retained something of its original meaning. Thus the Oxford Dictionary illustrates the extreme and controversial use of the word Imperium and Imperialism by a characteristic passage from the Daily News (May 28, 1898): 'That odious system of bluster and swagger and might against right on which Lord Beaconsfield and his colleagues bestowed the tawdry nickname of Imperialism.'

This is, of course, the language of political controversy; but the Oxford Dictionary itself gives us the first use of the word—'an imperial system of government: the rule of an emperor, especially when despotic or arbitrary'—and quotes a sentence from C. H. Pearson (1861):



THE PROTOTYPE OF EMPERORS

There were empires before the days of Augustus, but it is to ideas inherent in the Latin word 'imperium' that we owe our conception of an imperial state. On this Roman gem Augustus is crowned emperor by the goddess Fortuna.

From a Roman cameo

'Roman Imperialism had divided the world into masters and slaves.'

Without staying to examine critically the accuracy of Pearson's generalisation, we may note that the Dictionary correctly defines the later and less narrowly dogmatic uses of the word—uses to which we shall return. The same high authority defines an empire as 'an extensive territory (especially an aggregate of many separate states) under the sway of an emperor or supreme ruler; also an aggregate of subject territories ruled over by a sovereign state.' Stress is here laid, and rightly, first, upon the size of territory; and secondly, upon the multiplicity and variety of the constituent parts.

Thus Imperial Germany or India could more properly be described as empires than Tsarist Russia; for though Russia was bigger than Germany, Germany was a federal state made up of many constituent states, while Russia was not. India, again, though not federal, is a composite and not a unitary state. England could hardly be called an 'empire': a federated United Kingdom might more

properly be so described, and, most properly, the aggregate of countries—dominions, colonies, dependencies—which makes up the British Empire.

In another and more technical sense England has always, from earliest days, claimed to be an empire, on the ground that it declined to admit any superiority in the Holy Roman Empire—the Empire. The imperial style was not assumed by any sovereigns of the West except the Anglo-Saxon kings; and, says Sir Francis Palgrave, 'most evidently was it taken by them as denoting their imperial dignity.' The English kings from Athelstan to Canute regularly claimed and used the imperial title (either Basileus, Caesar or Imperator), and the style 'Emperor' was used of Edward I, Richard II and Henry V, the last of whom in 1416 refused to allow the landing of the Emperor Sigismund until he had formally repudiated any imperial claim over England.

The Reformation added force to this historic contention. Thus the Act in Restraint of Appeals to Rome (1533) specifically asserted independence not merely of Pope but of Caesar:

Where by divers sundry old authentic histories and chronicles it is manifestly declared and expressed that this realm of England is an Empire, and so hath been accepted in the world, governed by one Supreme Head and King, having the dignity and royal estate of the Imperial Crown of the same.

The Act of Supremacy (1534) enacted that the king should be 'accepted and reputed the Supreme Head in earth of the Church of England England as . . . and shall have and enjoy an Empire annexed and united to the Imperial Crown of this realm This use of the terms 'empire' and 'imperial' is further explained by Blackstone in his Commentaries (1765):

The meaning of the legislature when it uses these terms of *Empire* and *imperial* and applies them to the realm and crown of England is only to assert that our King is equally sovereign and independent within these his Dominions as any Emperor is in his Empire; and owes no kind of subjection to any other potentate upon earth.

The term Imperial borne by the British Legislature to-day contains, however, a

further implication. The legislature at Westminster is technically sovereign over, and competent to enact laws binding upon, not only the United Kingdom but the whole British Empire. There is, nevertheless, a nice shade of distinction in the titles borne by King George V, who is 'of Great Britain, Ireland and the British Dominions beyond the Seas King, . . . Emperor of India.'

An emperor is properly a King of Kings, a 'Shah-i-Shah,' as was the German Emperor, as is His Majesty King George V in India. Similarly, an imperial legislature implies the existence of subordinate legislatures, which, however powerful and dignified, are not sovereign. The Congress of the United States, on the other hand, could not properly be described as imperial, since it is not sovereign, but can legislate only within the four corners of a constitution to which it is subordinate.

As long ago as 1774 Edmund Burke correctly appreciated and defined the position of the British Parliament :

The Parliament of Great Britain sits at the head of her extensive Empire in two capacities : one as the local legislature of this island. The other and nobler capacity is what I call her imperial character ; in which she superintends all the several inferior legislatures.

Similarly when Joseph Chamberlain bade his countrymen 'think imperially' he was plainly inciting

What it means to think imperially them to think of themselves and act, not as members of an insular state, 'half lost among her seas,' but as subjects of an imperial state scattered over the world.

Enough has now perhaps been said to convey a general notion of what is properly implied in the terms 'empire' and 'imperial.' Even though we now insist, as we ought to insist, that the true conception of empire carries with it a profound sense of responsibility to subject peoples, and of service to mankind, nevertheless we must admit that the opportunity of service on the great scale comes from the wide extension of territory and of dominion. We are bidden, again properly, not to confound bigness with greatness ; yet bigness is none the less an inseparable

element in the idea of empire. A state may be small, no bigger for instance than the city of Hamburg ; a small empire would be a contradiction in terms.

Multiplicity and variety of the states or principalities that constitute the empire is an important though not perhaps an inseparable element. Autocracy, on the other hand, is not of the essence of empire. Many emperors

have indeed been autocrats, and it has been frequently asserted that

Can Democracy rule an Empire?

'Democracy cannot govern an empire.' But the existence of a world-wide British Empire, governed under the forms of a Parliamentary democracy, has already invalidated the generalisation.

Having thus cleared the ground by a definition of terms (and in none of the sciences is clear definition more important than in political science), we may proceed to consider the effect which the conception of empire has exercised upon the course of world history.

A distinguished novelist has lately confessed, with some naïveté, that having 'in the last few years' had occasion to study a certain amount of history, he has found himself amazed at 'the easy carelessness of the average historian's habitual terminology, his slovenly parallelisms and reckless assumptions.' In particular H. G. Wells poured scorn upon the failure of historians to classify, in a scientific way, political combinations and to distinguish the structural differences between one community and another. Take the word 'empire.' The historian, says Wells, 'slops the word Empire' over the whole face of history : 'Athenian Empire and Aztec Empire, Shan Empire and Sung Empire ; Empire of Alexander and Roman Empire, Mongol Empire and Hittite Empire, British Empire and Brazilian Empire ; it's all the same to him.'

That there is an element of truth in this impeachment, however exaggerated the language in which it is couched, may be frankly admitted ; but more questionable is Wells's proposition : 'There has indeed been only one real empire in the world, this that centred upon Rome and the Mediterranean.' That the Roman

and of entrenching the Persian Empire on European soil. Xerxes prepared for the task without haste but without rest; but the Persian dream of world empire was decisively ended by the Greek fleet at Salamis in 480 B.C. This dream, however, had been neither ignoble nor fantastic. Darius, Cyrus and Xerxes were inspired by the conviction that it was the high destiny of Persia to rule the world.

The famous battles which dissipated the dreams of Persia gave fresh courage and self-confidence to the Greeks, and in particular to the Athenians.

The Athenian 'Empire' is commonly computed to have lasted from the defeat of Xerxes to the capture of Athens by

Sparta and the break up of the first Confederacy
Did Athens rule an Empire? of Delos in 404 B.C.

Whether the rule of Athens can, during this period, properly be described as 'imperial' is a disputable point: federal it unquestionably was.

Gradually, however, the power and authority of Athens waxed, while the autonomy of the allies was substantially reduced. Yet, at the highest, Athens never attained to more than pre-eminence among the Hellenes. In some cities adhering to the league Athenian garrisons under regular Athenian officers were planted, and in other ways local autonomy was somewhat curtailed in the later years of the league. Athens, therefore, was accused of having constituted herself a 'tyrant city.' No accusation could, in Greek opinion, be more injurious and nothing did more to precipitate the Peloponnesian War, which brought the Athenian Empire to the ground.

Spartan hegemony succeeded to that of Athens, and after Leuctra (371 B.C.) Sparta was displaced by Thebes; yet the heroic page of Athenian history was not finally closed by the Peloponnesian war. In the fourth century there was a remarkable revival of Athenian power; the Delian Confederacy was re-established under her hegemony; for eleven years (357-346) she sustained the war against Philip of Macedon, and when at Chaeronea (338) the liberties of Greece were finally extinguished by him we find Athens still in the van of the Greek confederacy.

What is the reason for the political failure of Greece? It is to be found in the narrow meaning attached to 'politics.' Politics was the affair of the city ('polis'): civic autonomy, not empire, was the passion of the Greeks. The Confederacy of Delos was little more, the Achaean League (see Chap. 57) was nothing more, than a confederacy of cities. Emigrants from Greece founded, wherever they went, city communities on the model of those they had left. The political ideal of the Greeks never rose above, or, shall we say, went beyond, the ideal of the city state.

Federalism might have bridged over the difficulty, but federalism involves some partition of sovereignty, if not a circumscription of autonomy. Such circumscription the Greek cities could never permanently endure. Consequently Greece succumbed to a power with a larger though not a higher political ideal. The Empire of Greece was not of this world, it was spiritual and, therefore, eternal; consequently, it still dominates the spirit and mind of Man.

Politically, however, Greece failed. Her history, as Stanley Baldwin has pointed out, 'is one long failure to create an Empire. . . . Civic unity she could never achieve, Political failure and her attempts to weld of Greece together people of other blood was foiled on the very threshold.' Failure, as he finely added, 'is a more potent teacher than success, and the tragedy of her history only throws into more radiant relief the debt we owe her in those arts wherein she was supreme.' None the less, failure and tragedy it was.

A doubt obtrudes itself whether a confederation of city states, committed to the experiment of democracy in its most extreme form, could ever have withstood the onslaught of a state in which power was concentrated in the hands of an individual ruler of conspicuous ability. As things were, the Greek cities, with a diminishing population, with declining military efficiency, with a shrinking revenue raised mainly by the direct taxation of a rich minority and with a rapidly rising expenditure, stood no chance in a contest with a personal ruler of the type of Philip of Macedon.

Nor was it really to the detriment of civilization that Greece failed in that historic struggle. Hellenic civilization, always pre-eminently represented by Athens, was in the fourth century more than ever concentrated in the Athenian polity; and that polity was undeniably decadent. The policy of peace at almost any price was too popular. Grote has argued, with some plausibility, that had Athens, in the early years of Philip's reign, played her cards well, she might have made sure of confining Philip's ambition within the limits of Macedonia. All depended on whether her citizens would 'handle their pikes, open their purses, and forgo the comforts of home for the maintenance of Grecian and Athenian liberty against a growing, but not as yet irresistible, destroyer.'

More recent critics have cast doubts upon the ability of Athens to stay the onward march of Macedon. Athens, as D. G. Hogarth has pointed out, had during this period 'no truly imperial position at all, not even a hegemonic one . . . Philip obtrudes himself on this Athenian stage when decadence is no longer a tendency but an established fact, when democracy has passed into mob rule, and opportunists . . . are at the helm of state.' Consequently, so his argument concludes, Philip did no great hurt to civilization by his conquest of Greece.

On the contrary, 'Philip, by hastening the decadence of the Greek city state, did the Greek race in particular, and all mankind **Philip's service to humanity** in general, no small service.' Hellenism, hitherto constricted in its sphere though intense in its operation, entered, thanks to Philip and his still greater son, on a new and more vigorous life, and extended its influence over an infinitely wider area. 'The Greek,' as Hogarth finely says, 'went out to be the leaven of a world which had not forgotten art and theory, but was no longer to live by art and theory alone.'

Philip's work was preparatory. He established a great military monarchy in Macedon, and he placed that monarchy at the head of the Greek world. The story of Cyrus, Darius I and Xerxes fired his

imagination; but, just as he was about to start on a great expedition against the Persian King, Darius III, he fell by the sword of an assassin.

Philip was succeeded by his son Alexander, commonly and rightly known as the Great. Born in 356 B.C., Alexander was only twenty at the time of his accession, but he was already experienced alike in politics and in war. The son of Alexander of Olympias, an Epirote princess of the Aeacid House, Alexander, the pupil of Aristotle, was much more of a Hellene than his father, and it was his primary ambition to lead the Greek peoples in a united attack upon the Persian Empire.

The steps by which he achieved this ambition, and the strategy of his campaigns, are analysed in Chapter 46. By the year 330 the heart of the Persian Empire was in his grasp, and he set out on his famous march to subdue the provinces of the distant East. By the spring of 323 B.C. he was back in Babylon, but there he was taken ill of fever and died. He was only in the thirty-third year of his life and the thirteenth of his reign.

At its greatest extent the Empire of Alexander is said to have consisted, in addition to Macedonia itself, of twenty-two provinces. By no contemporary man, as Grote says, had any such power as Alexander's been known or conceived. Yet his ambition was not sated and his powers were unabated. At the time of his death he was planning fresh conquests, and had he lived would almost certainly have attained the goal of his ambition—the conquest of the whole habitable world as then known.

His empire would have been based not only on an irresistible army, but on sea-power, on commerce and on efficient organization. The interest which he took in the voyage of Nearchus; his foundation of the Egyptian Alexandria as a great entrepot of trade; his plans for the creation of a second Phoenicia on the Persian Gulf; the systematic plantation of colonies in his easternmost conquests—all these things are eloquent of the far-sighted views of the great conqueror and empire builder.

For a few years after the premature death of Alexander an attempt was made by a series of regencies to keep his empire together. But his rule had been essentially personal; before twenty years had passed his empire had finally broken up, and four kingdoms were established on its ruins. The house

Despoilers of Alexander's Empire of Seleucus — one of Alexander's Macedonian generals — reigned in

Nearer Asia from 312 to 65 B.C. Another Macedonian general, Ptolemy, established in Egypt a dynasty which lasted until 30 B.C., while more short-lived kingdoms were set up in Thrace, in Macedonia, in Asia Minor and in Greece.

In one sense, therefore, the Empire of Alexander expired with him, yet Hogarth's final estimate of his work is surely correct:

Although nothing that Alexander left unfinished at his death was done by another as he himself would have done it, very little that he had done was ever undone. No part of the vast area that he had traversed this side the Indus was governed for many centuries but by an administration western in origin and in type. Greece never recovered an independent voice to recall her sons from their mission in the ends of the earth, and Hellenisticism grew steadily out of Hellenism. Alexander's own principle and model of colonisation, the general scheme of his provincial organization, the channels into which half-unconsciously he had directed trade . . . held good until, and even beyond, the coming of Rome. He did more than any single man to break down that proud division of the world into few Greeks and myriad barbarians which had stimulated the seed of civilization, but was become a cramping and suffocating influence on the grown plant

Alexander's bequest to the world was, in fine, the idea of world dominion in place of the exclusive city state. Nevertheless, paradoxical as it may appear, the power upon which the inheritance ultimately devolved had its origin in a city state—Rome. Nor is this without significance. On the contrary, as more than one first-rate authority has insisted, the fact that Rome was a city and not a nation gave her a notable advantage as an imperialising power. Racial prejudices, which are the common if not the inseparable adjuncts of nationality, are apt to hamper an imperial

power in the government (though not in the conquest) of inferior races. Rome had no such prejudices; her citizenship was extended even to the people whom she conquered, and she drew upon the rich resources of her 'alien' citizens for generals, senators and even emperors.

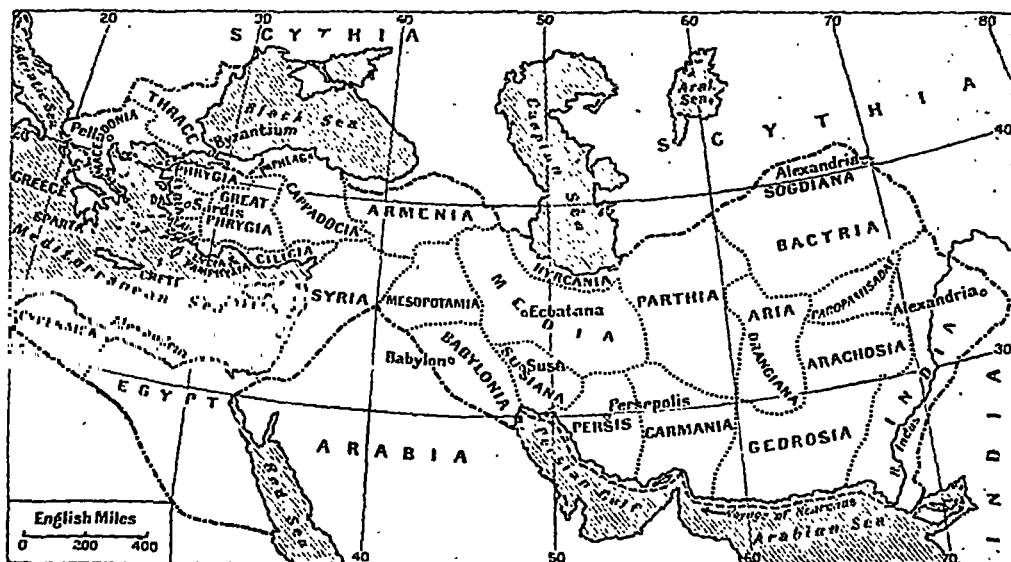
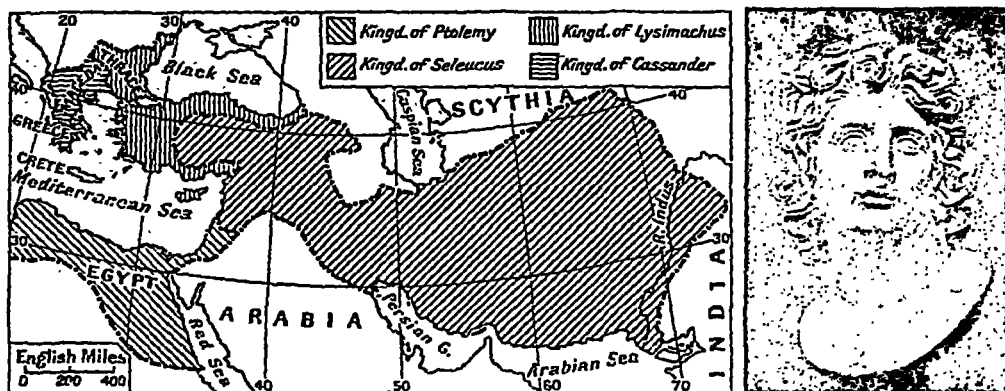
The Roman Empire reached its widest extent under Trajan (A.D. 98-117). It stretched from the Solway Firth to the valley of the Nile, from the Atlantic to the Caspian and the Persian Gulf. By what stages had this empire evolved?

The first stage represents the conquest of Italy, and extends from the foundation of the city of Rome (753 B.C.) down to the opening of the first Punic War (264 B.C.), by which time Rome was undisputed mistress of Italy from the Straits of Messina to the Arno. The next stage in the evolution of the Roman Empire is marked by the conquest of the West (264-105 B.C.). It covers the period of the three Punic wars and extends to the conquest of Transalpine Gaul; by the end of it Rome was mistress of all the western part of the European continent. The last stage, the conquest of the East, overlaps the previous one, beginning with the annexation of Macedonia in 168 and ending with the capture of Egypt in 31 B.C.

Rome, as Freeman says, was now 'fully mistress of her own civilized world.' Her dominions took in all the lands round the Mediterranean sea. By

this time, moreover, the Rome acquires the imperial idea had taken hold of the imagination of the ruling powers in Rome, though many of the more austere among Roman statesmen did all in their power to check the rising tide of imperialism. But their efforts were vain. Rome, as Lord Cromer in *Ancient and Modern Imperialism* has truly observed, was 'equally with the modern expansive powers . . . impelled onwards by the imperious and irresistible necessity of acquiring defensible frontiers.' It is also true that the public opinion of the world scoffed 2,000 years ago, as it does now, at the alleged necessity; and that each onward move was attributed to an insatiable lust for an extended dominion.

Like England, Rome did not set out originally with the intention of con-



SPLENDOUR AND COLLAPSE OF THE DOMINION WON BY ALEXANDER

Alexander's empire was the most ambitious and the shortest-lived in ancient times. It added to the Greek lands almost all of what had been the Persian Empire, and it is certain that the young Macedonian prince aimed at nothing less than world dominion. Yet his early death in 323 B.C. was the signal for disruption; and in the upper left-hand corner we see how the fabric of his achievement had suffered at the hands of rival 'war lords' less than twenty years after.

Bust of Alexander, Capitoline Museum, Rome

quest, but unlike Persia and Macedonia both Rome and England were drawn on by forces which they could not control. Between them, however, there was this difference, as Lord Bryce has pointed out: the Romans came to enjoy fighting for its own sake, the English were forced into it against their will. Moreover, Roman imperial administration never lost its military character; the British administration, except in India, never acquired it.

The reign of Trajan marked the zenith of the Roman Empire. One hundred and fifty years later internal decay had mani-

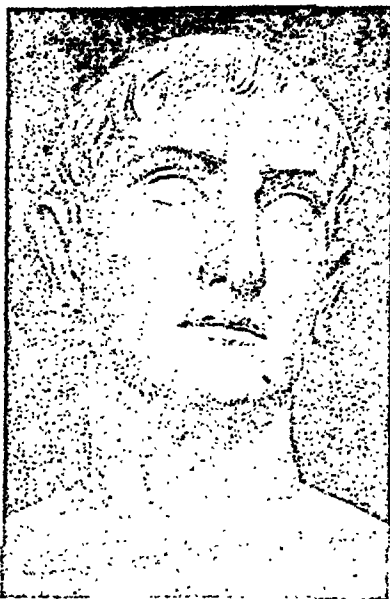
festly set in. Nor were external assaults wanting. The Goths invaded Italy in A.D. 250, and ten years afterwards the Persians inflicted a crushing defeat on the Emperor Valerian—a blow from which the Roman Empire in the East never recovered. Within the next thirty years Dacia was ceded to the Goths and the Franks settled in Gaul. In 330 a New Rome, destined to become the capital of the Eastern Empire, was built on the shores of the Bosphorus; in 364 the Empire was divided into the Western and Eastern Empires; and in 410 Alaric captured Rome.

For five hundred years (if we reckon from the First Punic War to the first invasion of the Goths) Rome had been the first power in the world; from the Third Punic War to the sack of Rome it had been dominant.

What were the forces which had held it together? First and foremost was the Roman genius for war; but hardly second to their fighting skill was their genius for government and administration. Under the Empire the municipal system, originally devised for Italy itself, was widely extended to the provinces; and with ever-increasing liberality the Roman franchise was conferred upon the provincials, until by Caracalla (A.D. 212) all free-born inhabitants of the Empire were placed upon a footing of equality. The language and civilization of Rome followed the eagles, and all subjects of the Empire were equal participants in the blessings conferred by the most perfect and scientific system of law that the world has known.

Yet even Rome could not evade the seemingly inevitable fate of decay. The central districts in particular began to exhibit the particularly insidious symptom of depopulation; taxation, crushingly burdensome upon all classes, pressed with especial severity upon the wealthy; agriculture was permitted to languish; citizens began to display a marked disinclination to public service; disintegration set in; provincial governors became virtually independent of Rome; and Diocletian (A.D. 284-305) shared his imperial authority with three colleagues.

The Empire was temporarily reunited under Constantine (323-337), but Constantine foreshadowed the ultimate division of the Empire by establishing a



MOST POWERFUL OF THE CAESARS

The Roman Republic carved out an empire, but could not rule it. An emperor was necessary; and it was under Trajan, at the end of the first century A.D., that the Roman dominions reached their widest extent.

Vatican bust; photo, Anderson

capital at Constantinople. On his death the Empire was divided between his three sons, and in 364, as already indicated, the final division into East and West was effected. To all these symptoms of internal decay was added the assault of the barbarians upon the frontiers and, later, the attack upon the heart of the Empire.

So passed the majesty of Rome; but passing Rome bequeathed to the world the idea of World Empire.

That idea was most effectively realized, during the Middle Ages, in the Catholic Church. The Papacy was the true heir of the Roman Empire, though not, as we shall see, the

sole and undisputed heir. The Papacy was, in the mordant phrase of Thomas Hobbes, 'the ghost of the Roman Empire sitting on the grave thereof,' but Dean Inge, in *Outspoken Essays*, has hazarded the daring suggestion that even 'if Christ had never lived, a spiritual Roman Empire not very unlike the Catholic Church would have appeared.' However that may be, the legacy of Rome was divided in somewhat unequal proportions between the Church, aiming at the establishment of a spiritual World Empire, and a Western Empire, which, revived under the aegis of the Papacy and inaugurated by the crowning of Charlemagne in Rome, was designated the Holy Roman Empire.

The enthralling story of the spiritual empire of the Church Universal is matter for other chapters of this history to unfold. It may well be held that in the continuous survival and unceasing activity of the Catholic Church, even though a large part of the world has withdrawn its allegiance from the Papacy, we still see the most imposing and the most abiding monument of the Roman Empire.

The secular legatee made much less of his share of the legacy. When Pope Leo III, in A.D. 800, placed the imperial crown upon the brows of the king of the Franks, it seemed to the world and to the recipient little more than the recognition of the facts of the actual situation. The commanding personality of the Frankish king; his all but universal monarchy; the coincidence that the imperial throne at Byzantium was temporarily vacant—all this seemed to render the ceremony peculiarly appropriate.

'In Charles, the hero who united under one sceptre so many races, who ruled all as the vice-gerent of God, the pontiff might well see, as later ages saw, the new golden head of a second image, erected on the ruins of that whose mingled iron and clay seemed crumbling to nothingness behind the impregnable bulwarks of Constantinople.' Thus wrote Lord Bryce in his famous essay on the Holy Roman Empire. 'The Coronation of Charles,' wrote Bishop Creighton in his *History of the Papacy*, 'corresponded to the ambitions of Latins and Germans alike. To the former it seemed to be the

restoration to Rome and to Italy of their former glory: to Germans the realization of the dream which had floated before the eyes of the earliest conquerors of their race.'

Charlemagne's position was, however, unique. He was in a sense extra-national. More significant from the German, perhaps from the European, point of view was the coronation in 962 of Otto the Great, son of Henry the Fowler, Duke of Saxony. This event cemented the curious but fateful connexion between the Holy Roman Empire and the German kingship. The disastrous effects of that connexion upon the national evolution of Germany, and less directly upon that of Italy, cannot be elaborated here; sufficient to say that for eight centuries and a half, from the crowning of Otto to the abdication in 1806 of the Emperor Francis II, the election to the Roman Empire (for the Empire remained nominally elective to the end) carried with it the crown of Germany, not to mention the more shadowy crowns of Italy and Burgundy as well. This connexion was fatal to the incipient national life of Germany: it postponed the realization of German nationalism until 1871.

The keynote to the history of medieval Europe is to be found in the idea of unity inherited from the Roman Empire, and perpetuated in the dual lordship of Emperor and Pope. From the crowning of Charlemagne to the Protestant Reformation, Pope and Emperor occupied, somewhat uneasily, a joint throne. According to medieval theory the Pope ruled the souls, the Emperor the bodies of mankind.

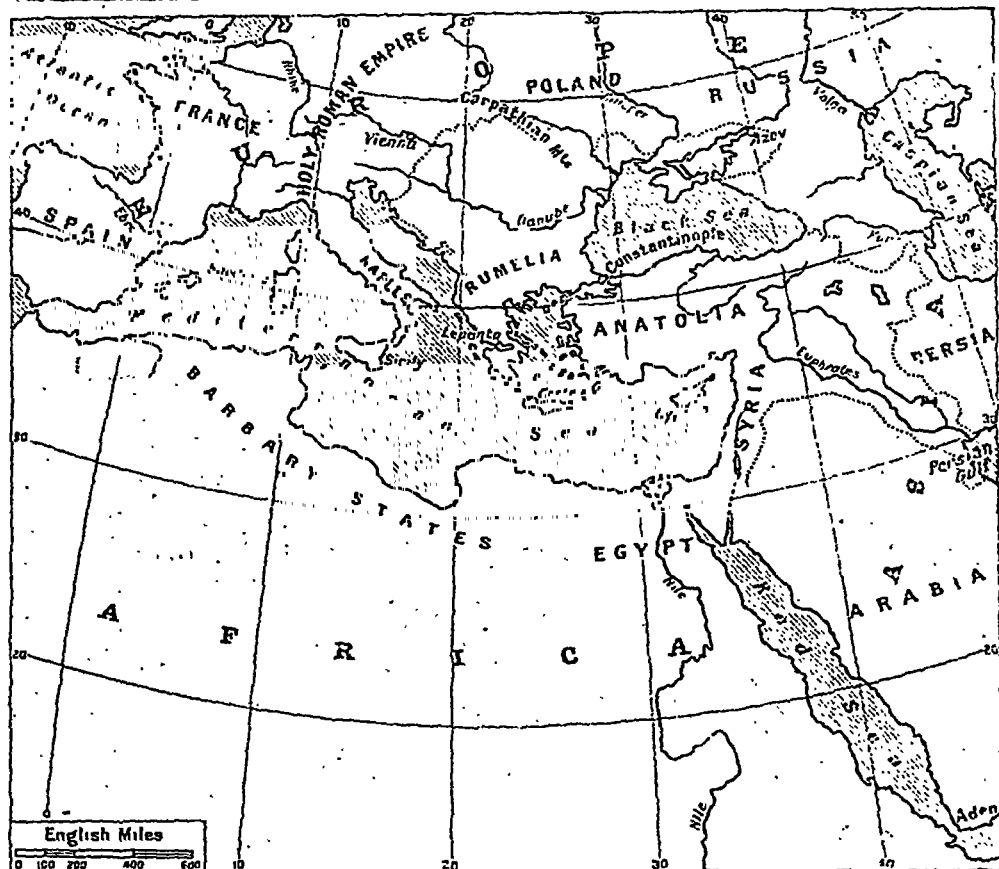
The jurisdiction of the Pope was more of a reality than that of the Emperor, but between them the idea of world unity was perpetuated. Nor had they any serious rival to fear. Very slowly did the work of national consolidation proceed and the nation state ultimately emerge. England achieved nationhood with unique precocity, France



THE PEDIGREE OF THE PAPACY

— After the break-up of Roman power, the true inheritor of Empire was the Pope. Even his title of Pontifex Maximus (High Priest) was inherited from the Caesars. On the left is Augustus as Pontifex (from the Ara Pacis); on the right, a statue of Boniface IX from S. Paolo Fuori le Mura, Rome.

Photos, Anderson



LANDS SUBJECT TO THE TURK UNDER SOLYMAN I

Under the Roman sway the theory of empire had notably progressed and expanded; with the advent of the Ottoman Turks there was a relapse to the standards of the ancient Orient, for theirs was a dominion won and ruled by the sword. It was in the reign (1520-1566) of Solyman I, called the Magnificent, that their frontiers were most widely flung.

and Spain followed suit after an interval of some three centuries, but not until the last decades of the nineteenth century was Europe exhaustively parcelled out among independent nation states.

Unity was broken up, however, by that series of movements which it is customary to describe collectively as the Renaissance and the Reformation, and both the revival of learning and the Protestant Reformation owed not a little to the advent in Europe of a new and conquering race—the Ottoman Turks.

The Ottoman conquests were true to Asiatic type, and the resulting empire resembled, not remotely, that of Darius and Xerxes. It rested solely on the sword. Between the time when in the middle of the fourteenth century (1354) the Ottoman

Turks first effected a lodgement on European soil, and the death of the great Sultan Soly-

man the Magnificent (1520-1566), under whom the Ottoman Empire reached its zenith, the advance of the conquering Turk was astonishingly rapid. The surrender of Constantinople (1453) crowned the conquest of the Balkan lands, but characteristically the Turk made no attempt to absorb the Balkan peoples.

In the sixteenth century the Turkish Empire rivalled the great Asiatic empires of antiquity. Estimates of population are untrustworthy, but it seems probable that at a time when Henry VIII ruled over about 4,000,000 Englishmen, the subjects



of the Sultan Solyman numbered 50,000,000. These included no fewer than twenty distinct races.

The Ottoman Empire at that time extended from the Carpathians to the Persian gulf, from the Caspian to the western Mediterranean, and embraced many lands in Europe, Asia and Africa. To the north the walls of Azov guarded the frontiers of the Turkish Empire against Russia; to the south, says Finlay in his *History of Greece*, 'the rock of Aden secured their authority over the southern coast of Arabia, invested them with power in the Indian Ocean and gave them the complete command of the Red Sea. . . . It was no vain boast of the Ottoman Sultan that he was master of many kingdoms, the ruler of three continents, and the lord of two seas.'

Nor did their widely extended empire lack an administrative system. It was

organized by Sultan Solyman in twenty-one Govern-
ments, which were
subdivided into two hun-
dred and fifty Sanjaks, each under its own

Bey. In land tenure and local government the system resembled the feudalism of the West; but it was feudalism devoid of its disintegrating elements, since all power was ultimately concentrated in the Sultan, who was at once 'Basileus' and 'Khalif,' Emperor and Pope.

For two centuries the Turks were a real menace to Europe: both on land and sea they were irresistible. Within five years, however, of Solyman's death the great naval disaster of Lepanto in 1571 revealed to an astonished but delighted world the obvious weakening of Ottoman moral and the waning of their power at sea. The failure of the Turks to take advantage of the distractions of their Christian enemies during the long agony of the Thirty Years' War (1618-1648) afforded further and welcome proof of a loss of energy and initiative. The great defeat inflicted upon them by Montecuculi at St. Gothard in 1664 showed that the Ottomans were no longer invincible on land, and twenty years later the failure of Kara Mustapha to take Vienna relieved Europe from the nightmare by which for two centuries it had been oppressed.

The most powerful and permanent impress left by the Ottoman Turk upon world history was the impulse given by the conquest of the Balkans and the eastern Mediterranean to the maritime enterprises and the oversea settlements of the western peoples. The conquest of Constantinople, Syria and Egypt blocked the paths by which for 2,000 years or more the merchandise of the Far East had reached Europe. As a result the Portuguese and the Spaniards set out to discover new sea routes to the East. In that quest Vasco da Gama doubled the Cape of Good Hope in 1498 for the first time and led a Portuguese expedition to India by sea; Columbus, seeking the same goal, discovered the West Indies, and perhaps the American continent. An English expedition, also led by an Italian emigrant, Cabot, reached North America about the same time.

Englishmen were slow to follow up the discoveries of the Cabots, but the Portuguese established a great empire in India and the Spaniards a greater in South America. Yet between the overseas empires of Portugal and Spain on the one hand, and on the other the empires of Persia, Macedon and Rome, there was nothing in common. The

former were impelled to undertake their hazardous enterprises under the goads

of religion and commerce. Their object was to Christianise a heathen world and to fill their own coffers. Missionary zeal and commercial acquisitiveness ultimately led to conquest and settlement, but the imperial idea did not furnish the original impulse.

Dutch enterprise was originally inspired by antagonism to Spain, which in 1580 had incorporated Portugal. The Elizabethan sea dogs were similarly impelled to maritime activity by hatred of the Spaniard and his Inquisition, by zeal for Protestantism and by the hope of gain. The pioneering work of France in North America was done by Jesuits. Evidently, then, we are coming under the dominion of forces of which Persia and Macedon knew nothing, and Rome little.

A philosophic historian has, however, taught us to perceive behind the rivalries

of the western powers in the seventeenth and eighteenth centuries a real, if only half-conscious, rivalry in pursuit of empire. Though the Portuguese Empire in India waned almost as quickly as it had waxed, the enterprising temper of other western powers was less evanescent. The English and the Dutch were in active commercial rivalry in the Far East from the early days of the seventeenth century. Later on England made a definite bid for maritime ascendancy by passing the Navigation Act (1651).

But a much more formidable duel than that with Holland lay ahead of England. Throughout the whole of the eighteenth century—broadly from 1688 to 1815—England and France were at war; and the prize for which the contest was fought was, as Seeley was the first to emphasise, supremacy in the East Indies, in the West Indies and in North America. From that prolonged struggle England eventually emerged triumphant. Thanks to Wolfe and Hawke, to Clive and Warren Hastings, to the Pitts, father and son, to Nelson, Wellesley and Wellington, France was driven out of Canada and India and the supremacy of Great Britain as a colonial power was assured.

But the expulsion of the French from Canada led, almost immediately, as Vergennes had sagely predicted that it would, to the loss of the first colonial empire of England in North America.

Eclipse of the British Empire The Puritan colonies in New England no longer stood in need of the old country's protecting hand, and thus the expulsion of the French gave them, if not a reason, at least an opportunity for revolt.

The acknowledgment of American independence in 1783 appeared to contemporaries to mark the eclipse of Great Britain, and to seal her doom as a world power. Well it might. The Peace of Versailles left her with considerable possessions in East and West, but without a single British colony, save Newfoundland. Yet a second colonial empire arose, phoenix-like, from the ashes of the first. The loyalists deserted the thirteen colonies, flocked across the border into Canada, and founded a British colony in Ontario, side

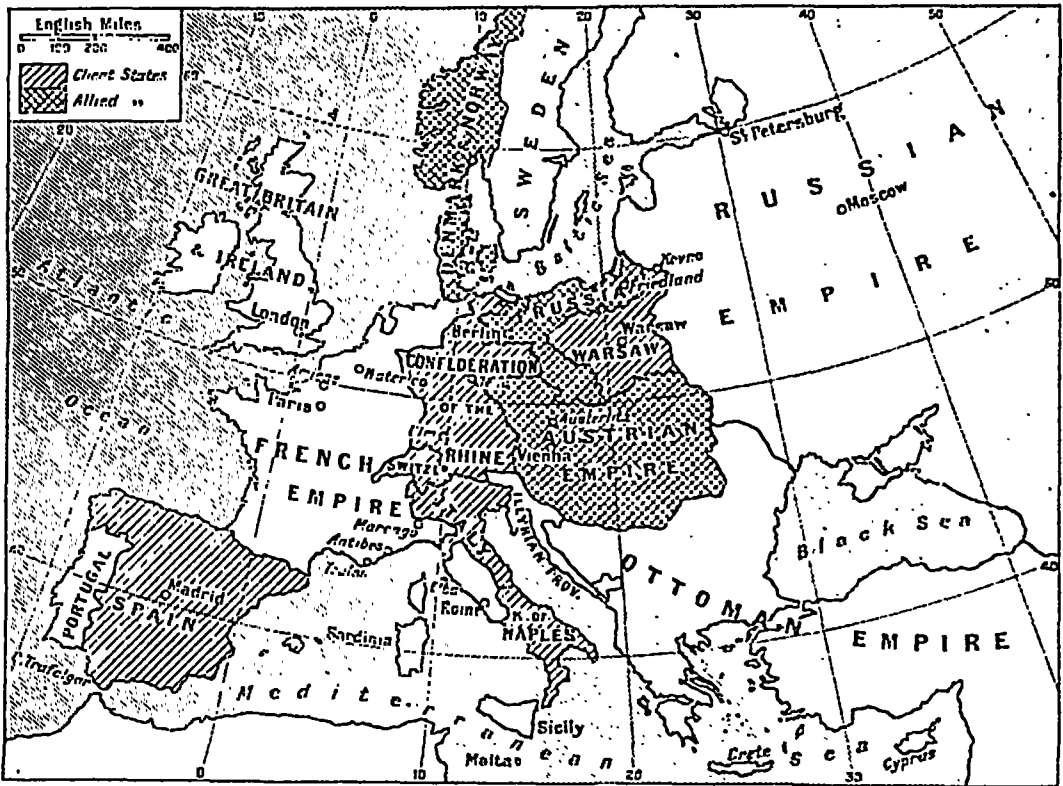
by side with the colony of Frenchmen in Quebec. The recent discoveries of Captain Cook in the Pacific were, about the same time, utilised for the transportation of the convicts whom the independent Carolinas declined to receive any longer. That convict settlement at Botany Bay marked the beginning of British colonisation in Australasia. The possession of Cape Colony—acquired first by conquest and later by purchase from the Dutch—laid the foundations of the British Empire in South Africa.

Cape Colony was not, however, finally confirmed to Great Britain until 1814, and before that confirmation was reached a titanic World Empire as struggle for world empire Napoleon's dream had been fought out between Great Britain and the soldier who is worthy to stand beside the greatest conquerors in world history, beside Darius and Xerxes, beside Philip and Alexander, beside Julius Caesar and Charlemagne—Napoleon Bonaparte.

From the outset of his marvellous career Bonaparte set before himself, definitely and determinedly, the goal of world empire. From the first he perceived quite clearly that Great Britain was the lion in his path. Moreover, he had already made up his mind, with paradoxical insight, that Britain was to be attacked—in Egypt. 'Really to ruin England we must make ourselves masters of Egypt.' Britain was by this time not merely innocent of any designs upon Egypt, but wholly devoid of any interest in it. Her route to India was by the Cape of Good Hope; Egypt was no more than the land of the pyramids and the Pharaohs.

Yet little as England guessed it, Napoleon had put his finger on the nerve centre of the British Empire to be. Nor did immediate failure deter him from the pursuit of his supreme object—the annihilation of England as a world power. To this project there was, however, one obstacle. If Napoleon was lord of the Continent, England was mistress of the seas; and the way in which his larger ambitions were foiled by this fact is the subject of Chapter 157.

Yet by 1810 Napoleon could reasonably claim to be the new Charlemagne.



THE NAPOLEONIC EMPIRE AND THE MAN WHO MADE IT

It is hard to classify Napoleon's Empire, for it was never allowed to reach mature development. In its meteoric rise, its military and personal character, it resembled Alexander's; but its organization into client kingdoms reminds one of the British Empire in India, or of the United States of America, as though a United States of Europe were its logical outcome.



Emperor of France, King of Italy, President of the Confederation of the Rhine (and virtually, therefore, Emperor of Germany), he surrounded himself with client kingdoms: one brother, Joseph, was king of Spain; another, Louis, king of Holland; a third, Jerome, king of Westphalia; a brother-in-law, Joachim Murat, was king of Naples; one of his marshals, Bernadotte, was crown prince of Sweden. But there was a canker eating at the heart of the Napoleonic Empire. The attack upon Spain evoked the spirit of nationality, and, as Southey sang:

From Spain the living spark went forth:
The flame bath caught, the flame bath spread.

The flame of nationality spread to Germany, and the result was that the German War of Liberation was fought

in a nationalist spirit. To that spirit Napoleon ultimately succumbed, and on that principle the map of Europe in the succeeding period was reconstructed.

To the triumph of the nationalist principle no one, in truth, contributed more powerfully than Napoleon himself. A united Italy, a united Germany, perhaps we may even say an enlarged and self-conscious Yugo-Slavia, are monuments to the abiding influence of the Napoleonic Empire.

The evolution of nationalism in modern Europe is not, however, pertinent to the present study. In a sense nationalism may be regarded as the antithesis of imperialism. Or should we rather say that nationalism is a preliminary to imperialism? Be that as it may, the nationalist movement reached its zenith in the 'seventies of the nineteenth century. By 1878 Europe was exhaustively parcelled out into states which, in most cases,

roughly corresponded with distinctions of nationality.

The Hapsburg Empire was, indeed, a conspicuous negation of that principle, and a partitioned Poland mocked it. But the Ottoman Empire was palpably breaking up, and from its ruins nation-states were emerging: Greece, Roumania, Bulgaria and Serbia. For the rest, Italy and Germany had achieved unity; Spain, Portugal, France, Holland, Belgium, Russia, Denmark, Sweden-Norway, Great Britain, were already independent nation-states.

The 'eighties announced the opening of a new era in European history—nay, in world history. 'Yes,' said the veteran Bismarck—perhaps regretfully—'yes, this is a new age.' What was its dominating and differentiating characteristic? General Smuts shall answer. Speaking to the Geographical Society in London after the Great War, he said:

The cardinal fact of geography in the twentieth century is the shortening of distances and the shrinkage of the globe. . . . The result is that problems which a century ago, or even fifty years ago, were exclusively European now concern the whole world.

France, Holland, Spain and, above all, Great Britain had long since been world powers, though many of the extra-European possessions of the first three powers had fallen to the fourth. None

the less, the last two decades of the nineteenth century witnessed a new expansion of Europe under wholly new conditions. Shortly after the Great War two young Englishmen flew, via Egypt, Basra, Calcutta and Singapore, from England to Australia. Their flight, covering a distance of 14,000 miles, occupied only 190 flying hours.

Science has annihilated space and time. Basil Mathews has put the matter in a nutshell:

The railway and the steamship are like the pulsating arteries in a body carrying the blood of humanity to and fro; the cables and the wireless are like the nerves, flashing ideas from brain to finger and foot, and sensations from limb back to brain.

Not in England only did men begin to think in continents. Africa and

Asia, the Atlantic and the Pacific began to react upon Europe as they had never done before. Imperialism was, indeed, to a great extent the outcome of economic necessity. Industrialism brought in its train three results: a demand for food wherewith to feed the new urbanised populations; a demand for raw materials; and a demand for markets in which to sell the goods manufactured in bulk by the newly invented machines.

The scramble for non-European territory began with the entry of Germany into the colonial arena. Down to 1884 Germany owned not a foot of land outside Germany, but in the ten years after her unification she had undergone an economic transformation. Her population was increasing Germany enters the Colonial Arena by leaps and bounds.

Where were the people to live? How were they to find employment? How were they to get food? After 1876 the Germans began to leave their homeland at the rate of 200,000 a year, and leaving the homeland they were lost to the flag.

The Fatherland must be expanded to receive its citizens, but in what direction? Brazil seemed to beckon to Germany, but the Monroe doctrine barred the way to acquisition. So Germany turned to Africa and the Pacific, and in a few months found herself planted on both coasts of Africa and in several islands in the Pacific archipelago. France, having stanchd her wounds at home, also entered upon a new period of expansion. Italy gave signs of similar ambitions. Yes, the new era had opened, and 'weltpolitik' was its distinguishing mark.

Among world powers, however, Great Britain stood first without a rival. Having lost, towards the end of the eighteenth century, one great colonial empire, she rapidly founded in the course of the nineteenth century a second. From the earliest days of her expansion the British Empire has consisted of two clearly distinguished categories: on the one hand there are the lands, sparsely inhabited, which by reason of climatic and other conditions offer suitable sites for the settlement of men and women of British birth and traditions; on the other hand there are the countries

already largely, and in some cases over-largely, populated, which for this and other reasons never become the permanent homes of Britons, but in which Britons rule and trade and whence they derive honour and wealth.

To the countries belonging to the former category Britons could without difficulty transplant their native institutions, political and social, their laws, traditions, creeds and customs. Thus British North America, Newfoundland, South Africa, Australia and New Zealand gradually attained, under the sovereignty of the British Crown and the British Parliament, complete domestic autonomy and became known as Dominions. India, on the other hand, with its many states, its teeming populations, its rival creeds and inter-racial jealousies, has remained a great dependency, ruled by a viceroy, though with a growing but still limited allowance of local self-government, and with the help of services, military and civil, in increasing measure locally recruited. Between the self-governing dominions on the one hand, and crown colonies and dependencies on the other, there are grades and varieties of governments too numerous for specification.

Regarded as a unit the British Empire is unique, without precedent or parallel in the history of the world. And for this reason: there have been great empires before Britain was heard of; there have been democracies in the world long before the English people worked out the principles of parliamentary democracy. But never before has the attempt been made

to rule a world empire by the machinery appropriate to a genuine democracy. It is this fact which, apart from its unprecedented extent, its unique variety, its geographical distribution, its vast commerce and the innumerable problems which it offers to the statesman, the philanthropist, the trader, the missionary and the scientist, constitutes the outstanding significance and the peculiar interest of the British Empire.

Attempts have often been made to institute a comparison between the British Empire and that of Rome. Two essays—

those of Lord Cromer and Lord Bryce—have been significantly content to confine the comparison to the Roman Empire and the British Empire *in India*. Even so the comparison must necessarily be vitiated by the elaborate apparatus and the multiplied resources which science has placed at the disposal of the great imperial power of our own day. Much more is it vitiated if the comparison be extended to the other dominions of the British Crown.

More significant even than the resources of science is the new spirit and the temper in which the citizen rulers of the greatest empire of the modern world approach the solution of the problems of Modern World which Empire propounds to them. They are not so much dazzled by the glint, the glory and the glamour of Empire; rather are they perplexed by the intricacy and variety of the problems which daily they are called upon to solve.

Not for the pride and power,
God gave thee this in dower.

It may be that responsibilities of empire are not universally or continuously realized, but the heaven is working, and will leaven the lump.

The change of spirit here faintly adumbrated, so far from diminishing, may greatly enhance the influence of the idea of Empire upon world history. Potent as were the material forces at the command of Darius and Alexander, of Caesar, Solymán and Napoleon, they were weak as water compared with the forces generated by the spirit of sacrifice and service. There are those who scoff at the burden shouldered by the white man, and who are quick to condemn the economic exploitation of the coloured peoples under the cloak of philanthropy. Exploitation is indeed far from unknown; yet more and more the advanced peoples of the world, and in particular the British people, are coming to regard the 'well-being of the races not yet able to stand alone as a sacred trust of civilization.'

Thus the idea of Empire and the influence of Empire persist: but in the course of the ages the idea has been, if not actually attenuated, yet radically transformed.

First Era

EARLY CIVILIZATIONS

4000 B.C.—550 B.C.

Chronicle I—TWILIGHT, 4000-1580 B.C.

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|---|---|
| 14. The Rise of Ordered Civilizations
<i>Prof. J. L. Myres, D.Sc., F.B.A.</i> | 18. Babylonia in the Days of Hammurabi
<i>R. Campbell Thompson, D.Litt.</i> |
| 15. Early Egyptian Life and Culture
<i>Prof. T. Eric Peet</i> | 19. Survey of Early Mediterranean Cultures
<i>Prof. R. A. S. Macalister</i> |
| 16. Mesopotamia's City States before the Rise of Babylon
<i>C. Leonard Woolley</i> | 20. Europe in the Ages of Stone and Bronze
<i>Prof. Sir Bertram Windle, D.Sc., LL.D., F.R.S.</i> |
| 17. Life of Egypt under the Middle Kingdom
<i>Prof. T. Eric Peet</i> | 21. The Gods of the Twilight
<i>Stanley A. Cook, Litt.D.</i> |

Chronicle II—DAWN, 1580-900 B.C.

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| 22. The Egyptian Empire: Its Splendour and Decline
<i>Prof. F. Llewellyn Griffith, LL.D., F.B.A.</i> | 26. The New Peoples: A Study of Race Movements
<i>Prof. R. A. S. Macalister, Litt.D., LL.D.</i> |
| 23. The Empire of the Hittites
<i>Prof. John Garstang, D.Sc.</i> | 27. Israel in the Light of History
<i>Rev. T. H. Robinson, D.D.</i> |
| 24. The Religious Revolution in Egypt
<i>Prof. Llewellyn Griffith</i> | 28. The Greeks in the Heroic Age
<i>Prof. E. A. Gardner, Litt.D.</i> |
| 25. Minoans & Mycenae: How Civilization Came to Europe
<i>Prof. J. L. Myres</i> | 29. Troy: Its Place in Literature and History
<i>A. J. B. Wace</i> |

Chronicle III—DAYLIGHT, 900-550 B.C.

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|--|---|
| 30. Growth of Culture in Barbaric Europe
<i>V. Gordon Childe</i> | 33. Egypt in the Brilliance of Decay
<i>H. R. Hall, D.Litt.</i> |
| 31. Imperial Nineveh & Babylon
<i>R. Campbell Thompson</i> | 34. Greece on the Eve of Her Greatest Glory
<i>Stanley Casson</i> |
| 32. The Dorian Invasion and the Ionian Migrations
<i>Prof. W. R. Halliday</i> | 35. The Alphabet and Its Importance for Civilization
<i>E. H. Minns, Litt.D., F.B.A.</i> |

THIS, the third division of our work, comprises the First Era of record history; it narrates the growth and collapse of the ancient empires down to the first flowering of Hellenism and the entry of Persia on to the world's stage, thus preparing it for the epic contest between these two rival cultures. As for dates, all that lie before 1580 B.C.—the concern of Chronicle I—are the merest approximations; thereafter, world chronology, within a year or two, gives rise to no serious disputes.

First Era: 4000-550 B.C.

SYNCHRONISED TABLE OF DATES

Egypt and the West

Chronicle I. 4000-1580 B.C.

Mesopotamia and the East

B.C.	Invention of Solar Calendar in Egypt?
4241	Predynastic period: Upper and Lower Kingdoms.
c. 3800	Brick cemeteries in Egypt. Copper in use.
3400	Early Minoan Period I in Crete: Bronze in use.
2980-	First Egyptian Dynasty; Narmer (Menes?) combines
2900	Upper and Lower Kingdoms. Memphis refounded.
2980-	Third Egyptian Dynasty (Khasekhemui). Memphis
2900	made capital. First Stone Pyramid (Zeser).
	Sneferu conquers Sinaitic Peninsula.
2900-	Great Pyramid Age in Egypt (Khufu and Khafra—
2750	Fourth Dynasty).
	Crete: Early Minoan II.
c. 2870	First City of Troy.
2750	Fifth Dynasty. Pharaohs thenceforth deified.
2430	End of 'Old Kingdom' in Egypt; first interregnum
	of anarchy.
	Heracleopolitan usurpers; invasion of Asiatics.
	Crete: Early Minoan III.
2160	'Middle Kingdom' begins with Eleventh Dynasty.
	Thebes the capital. Bronze now common.
	Crete: Middle Minoan I.
2000	Twelfth dynasty. Great revival of Egyptian Art.
	Crete: Middle Minoan II.
1788	Succession of weak dynasties in Egypt; second
	interregnum of anarchy.
	Middle Minoan III in Crete.
	Hyksos conquest of Egypt—two dynasties; intro-
	duction of war-chariot.
1670	Egyptian war of liberation; Seventeenth Dynasty
	ruling at Thebes.
1580	Expulsion of Hyksos by Thebans.
	Aahmes founds 'New Kingdom.'
	Crete: Late Minoan I.

Egypt and the West

Chronicle II. 1580-900 B.C.

Mesopotamia and the East

1580	'New Kingdom' of Egypt. First Empire.
1543	Thothmes I marches
1501-	Reigns of Thothmes II, Queen Hatshepsut and
1479	Thothmes III. Expedition to Punt.
1479	Battle of
1474	Thothmes III reconquers
1412-1380	Development of diplomatic relations between
1375-	Religious reforms of Akhnaton.
1358	Akhetaton founded at Tell-el-Amarna
	Crete: Late Minoan II and III.
1358	Tutankhamen.
	Disruption of Egyptian possessions
	Crete: Sea Power of 'King Minos'?
1350-	Internal reforms of Harnhab.
1321	
1321	Second Empire: Rameses I. Hittite
1296	Battle of Kadesh between
1280	An 'uti possidetis' peace
	Iron in use in Egypt.
1225	Merneptah: reputed Pharaoh of Exodus.
1221	First Raid on Egypt by 'Peoples of the Sea.'
1190	Second Raid by 'Peoples of the Sea'; Philistines
	defeated in sea battle.
1090	Achaean expansion. Fall of Troy.
	End of Egyptian Empire; disruption.
	Dorian expansion.
947	Shashank (Shishak) founds Twenty-second Dynasty
	and reunites Egypt; Bubastis the capital.
930	Nubia independent.
	Shashank invades Palestine

B.C.	Sumerians established in Babylonia.	c. 4000
	Semitic Dynasties recorded at Kish.	
	Sumerian Dynasties recorded at Erech, Ur, etc.	
	Ur-Nina, priest-prince of Lagash.	c. 3000
	Eannatum of Lagash.	c. 2725
	Lagash at war with Umma. Stele of Vultures.	
	First contemporary records.	
	Entemena of Lagash.	c. 2850
	Urukagina of Lagash.	2781
	Conquests of Lugal-zaggisi.	2775
	Sargon founds Agade; Semitic Empire.	2750
	Panba, Hittite king ruling at Hattusas.	c. 2070
	Stele of Naram-Sin.	
	Inroad of Gutians into Babylonia; period of	2542-
	anarchy.	2410
	Gudea of Lagash.	c. 2450
	Aryan migrations in progress; dates uncertain.	c. 2490
	Independent kings of Assyria: Ushpia and Kikia.	2409
	Sumerian Empire under Ur-Engur at Ur.	2225
	First Babylonian Dynasty (Semitic).	2123-
	Hammurabi at Babylon. (Code, 2090).	2030
	Kassite raid.	2072
	Dynasty of 'Sea Country' Kings; hostilities with	2070
	Babylon.	
	Expansion of Hittites under Hattusil I.	2000
	Hittite raid on Babylon under Mursil I.	1926
	Kassite conquest of Babylon, and Dynasty.	1746
	Establishment of Mitannian kingdom on Upper	1700
	Euphrates (now or earlier).	
	Assyria independent and overlord of Middle	
	Euphrates.	
	Kassite Dynasty still reigning in Babylon.	1543
	to Euphrates.	
	Megiddo.	1479
	Syria and crosses Euphrates.	1474
	Egypt, Babylon, Mitanni, Hittites, Assyria.	1412-1380
	Growth of Hittite power under Subbiluluma.	1395-
		1350
	Ashur-uballit; Assyrian activity begins.	1381
	Amarna Letters	
	in Syria; End of First Empire.	
	Accession of Mursil III to Hittite throne	1345
	Accession of Mutallis	1320
	and Egyptian contests in Syria.	1315
	Adad-nirari I of Assyria; defeats Kassites.	
	Rameses II and Mutallis.	1296
	between Hittites and Egyptians.	1280
	Shalmaneser I; conquests in Asia Minor.	1276
	Tukulti-Ninurta of Assyria; wars with Hittites;	1256
	defeats Kassites.	
	Great migrations of northern peoples; Philistine	c. 1200
	invasion and settlement.	
	Extinction of Hittite power.	
	Ashur-dan of Assyria breaks Kassite power.	1174
	Babylonian raid on Assyria; Assyrian relapse.	1107
	Hebrew kingdom: Saul.	c. 1025
	Aryan domination in Northern India.	
	Disruption of Hebrew kingdom.	945
	and captures Jerusalem	930
	Adad-nirari II; revival of Assyria.	911

B.C.		B.C.
c. 900	Etruscan and Latin penetration of Italy? Homeric poems. Development of Greek city states.	
884	Laws of Lycurgus, Sparta (traditional).	
880	Thebes and the Delta under independent rule.	
800	Carthage founded (traditional).	
786	First Olympiad; Greek Chronology.	
783	Rome founded (traditional).	
745	Complete disruption of Central Authority in Egypt; Kashta the Nubian holds Thebes.	
734	Syracuse founded.	
722	Piankhi the Nubian invades Egypt.	
	Defeat of Egyptians	
705	Tarentum founded.	
700	Defeat of Egyptians by Sparta predominant in Peloponnese.	
689	Tabarka (Tirhaka) the Nubian king in Egypt.	
683	Annual archons at Athens.	
671	Egypt subdued by	
669-626	Ashurbanipal (Sardanapalus) establishes Psaamtichus I founds Twenty-sixth Egyptian Dynasty; revival of art and power.	
625	Periander 'tyrant' of Corinth.	
605	Final defeat of Assyrians and Egyptians under	
600	Thales of Miletus.	
594	Etruscan (Tarquin) Dynasty at Rome.	
	Solon's legislation at Athens.	
570	Servian reforms at Rome (traditional).	
569-526	Aahmes II (Amasis) king of Egypt; relations with Greeks.	
560	Peisistratus tyrant of Athens.	
	Assyrian chronological record begins.	893
	Tukulti-Ninurta II; wars with Urartu (Armenia); recovery of Assyrian power.	889-884
	Ashur-nasir-pal II marches to Mediterranean.	878
	Syrian confederation headed by Ben-Hadad; alliance with Ahab of Israel; battle with Shalmaneser III at Karkar.	853
	Civil wars in Assyria.	827
	Order restored in Assyria.	821
	Tiglath-Pileser III.	745-727
	Supremacy of Assyria; Sargon II.	722
	by Sargon at Raphia	720
	End of Kingdom of Israel. Rise of Mushki (Phrygia). Sennacherib.	705-681
	Sennacherib at Eltekeh	700
	Rise of Media and Lydia.	
	Babylon taken and sacked.	680
	Esarhaddon.	681-869
	Esarhaddon of Assyria.	671
	Assyrian overlordship in Egypt.	669-626
	Alliance against Assyria of Cyaxares the Mede and Nabopolassar the Chaldean.	620
	Destruction of Nineveh by Medes and Babylonians.	612
	Neo-Babylonian Empire founded by Nabopolassar.	
	Necho by Nebuchadrezzar at Carchemish.	605
	End of Kingdom of Judah: Babylonish captivity.	586
	Croesus King of Lydia; conflicts with Medes.	565
	Birth of the Buddha.	c. 561
	Birth of Confucius.	550
	Rise of Cyrus the Persian.	550

KINGS & DYNASTIES OF EGYPT

Many variants of Egyptian names are in use. The commonest Egyptian forms of the kings' personal names are given here, with different readings, time-hallowed erroneous forms or well known Greek or Biblical versions in brackets. For some of the earliest only the throne-name or 'Horus name' is known; sometimes both personal and Horus names appear, if each has obtained currency. Both this and the subsequent Mesopotamian list, for the sake of completeness, go beyond the closing date of our First Era. All dates before 1580 B.C. are tentative.

Predynastic Kings

Before the first dynasty there were two kingdoms; a few names of kings of the North and kings of the South have been deciphered from the 'Palermo Stele' (Fifth Dynasty) and others:

Ro (South)
Tiu (North)
Thesh "
Hsekiu "
Uaznar "

1st Dynasty

Circa 3400-3200 B.C.

Southern conquerors of the North and unifiers of Egypt. Memphis founded.

The 'Scorpion,' Ip
Narmer
Aha Men. Menes?
Zer Atoti (Khent)
Za (Zet, Ata)
Den Semti
Enzib Merpeba
Semerkhet Hui (Shemsu)
Ka Sen

2nd Dynasty

Circa 3200-2980 B.C.

Perhaps a family of northern origin.

Hotep-sekhemui
Raneb Kakau
Neneter
Perenmaat
Peribsen
Senedi
Neferka-ra
Neferka-sokari
Huzefa

3rd Dynasty

Circa 2980-2900 B.C.

New conquerors from the South. Memphis made capital.

Khasekhemui Besh (Bebi)
Zoser (Tcheser, Zoser)
Sanekht
Zeserteti
Sezes
Neferka Huni
Sneferu

4th Dynasty

The great pyramid builders; zenith of the 'Old Kingdom' in power and art.

B.C.
Sharu (?) c. 2900-2898
Khufu (Cheops) 2898-2875
Razedef 2875-2867
Khafra (Chephren) 2867-2811
Menkaura (Mycerinus) 2811-2788
Shepseskaf (and perhaps others) 2788-2755
(Thamphthis ?) 2755-2750

5th Dynasty

Northern kings from Heracleopolis; prominence of Ra-worship.

B.C.
Userkaf c. 2750-2743
Sahu-ra 2743-2731
Neferirkara 2731-2730
Shepseskara 2730-2723
Khanefer-ra 2723-2722
Ne-user-ra (User-en-ra) 2722-2691
Menkau-heru 2691-2683
Dedkara Isesi 2683-2655
Unis 2655-2625

KINGS AND DYNASTIES OF EGYPT : CONTINUED

6th Dynasty

Central power of the Pharaoh steadily waning.

	B.C.
Teti	c. 2625-?
Userka-ra Ati	? -2595
Pepi I	2595-2542
Meron-ra I	2542-2538
Pepi II	2538-2444
Meren-ra II	2444-2443
Neterka-ra	2443-?
Menka-ra	? 2431

7th, 8th, 9th, 10th Dynasties

Circa 2431-2160 B.C.

Here follows the first period of anarchy; invasion of Asiatics. Two dynasties ruling at Heracleopolis appear to be the most important, but how far they were contemporaneous with other princes ruling elsewhere whose names are recorded is uncertain. The country was split up and when centralised power (the 'Middle Kingdom') reappears with the eleventh dynasty, Thebes in the south is its seat.

11th Dynasty

From Thebes. Intef I was the first to assume the royal title; Mentuhotep III to conquer all Egypt.

	B.C.
Intef I	c. 2160-?
Intef II	?
Mentuhotep I	?
Mentuhotep II	? -2078
Mentuhotep III Nebha-petra	2078-2030
Mentuhotep IV	2030-2000

12th Dynasty

Dates are given from the death of the father, although the son in this dynasty was usually admitted as coregent.

	B.C.
Amennemhet I	c. C. 2000-1970
Senusret (Usertsen, Sesos-tris) I	1970-1935
Amennemhet II	1935-1903
Senusret II	1903-1887
Senusret III	1887-1849
Amennemhet III	1849-1801
Amennemhet IV	1801-1792
Sebekneferu-ra (Queen)	1792-1788

13th, 14th, 15th, 16th Dynasties

Circa 1788-1580 B.C.

Here follows the second anarchical period, with Thebes losing power and invaders coming from the east. Finally two dynasties of foreign Hyksos or 'Shepherd' kings rule practically all Egypt.

17th Dynasty

Contemporary with the last of the Hyksos, a line of Theban rulers were independent. The final struggle broke out under Sekenenra III.

	B.C.
Sekenenra I	1635-1615
Sekenenra II	1615-1605
Sekenenra III	1605-1591
Uazkheperra Kamose ..	1591-1581
Senekhtenra	1581-1580

18th Dynasty

Hyksos expelled by Aahmes, who founds the 'New Kingdom' or 'Empire.' Thebes the seat of power; climax of Egyptian greatness; Amen-worship pre-eminent.

	B.C.
Aahmes (Ahmose, Amasis)	1580-1557
Amenhotep (Amenophis) I	1557-1541
Thothmes (Thutmose) I	1540-1501

	B.C.
Thothmes II	
Hatshepsut (Queen)	.. 1501-1479
Thothmes III	
Thothmes III	1479-1447
Amenhotep II	1447-1420
Thothmes IV	1420-1411
Amenhotep III	1411-1375
Akhnaton (Amenhotep IV)	1375-1358
Smenkhkara (Sakere) ..	1358
Tutankhamen	1358-1353
Ay (Ai)	1353-1350

19th Dynasty

A fresh period of power after the temporary confusion occasioned by Akhnaton and his heresies.

	B.C.
Horemheb (Harmhab) ..	1350-1321
Rameses I	1321-1320
Seti (Sethos) I	1320-1300
Rameses II	1300-1225
Merneptah	1225-1215
Amenmeses	1215
Seti II	1215-1209
Seti II	1209-1205

20th Dynasty

After a short period of anarchy, during which Arsu, a Syrian usurper, reigned for some years, order was restored by Setnekht, of the family of Rameses II. Loss of Egyptian Empire in Syria.

	B.C.
Setnekht	1200-1198
Rameses III	1198-1167
Rameses IV	1167-1161
Rameses V	1161-1157
Rameses VI	1157-1154
Rameses VII	1154-1152
Rameses VIII	1152-1150
Rameses IX	1150-1130
Rameses X	1130-1124
Rameses XI	1124-1094

21st Dynasty

1094-947 B.C.

The last few kings of the Twentieth Dynasty were mere nonentities in the hands of the priests of Amen; and on the death of Rameses XI, Hor-Heru, the high priest, seized the power, founding the line of Priest Kings. In the meantime, however, a prince of Tanis in the Delta assumed independent royalty—Nesu-ba-neb-tet, the Smendes of Manetho; and during this period sometimes a Tanite king practically ruled the whole land, generally Thebes maintained a precarious independence, and on one occasion at least a high priest obtained the Tanite throne by marriage.

22nd Dynasty

The old order is definitely at an end; the founder of this dynasty was a descendant of Libyan mercenaries who had made themselves powerful in Heracleopolis. Bubastis was chosen as the capital, Egypt united and some measure of foreign power regained.

	B.C.
Shashank (Shishak) I ..	947-925
Osorkon I	925-889
Takeleth (Takelot) I ..	889-865
Osorkon II (co-regent, 880)	865-850
Shashank II	850-825
Iuput	825-821
Shashank III	821-769
Pamai	769-763
Shashank IV	763-725
Osorkon IV	725-720

23rd Dynasty

A younger branch of the Libyan family had been installed in the high-priesthood of Amen at Thebes, and in

the reign of Osorkon II declared its independence, passing as the Twenty-third Dynasty. But by the end of these two contemporaneous dynasties almost every town had a petty chief.

	B.C.
Harsiesi	860-838
Pedubaste (Peta-bast) ..	838-815
Takeleth II	815-780
Osorkon III	780-750
Takeleth III (co-regent 757)	750-745
Rudamen (co-regent 750)	745-742

24th Dynasty

From 726 the real power in the north belonged to Tafnekht, prince of Sais, whereas in about 745 Thebes had passed to a Nubian king, Kashta, and his son Piankhi, who in 722 attacked and defeated the Saite. Owing to a defeat of the Nubian arms in Palestine by the Assyrians, Tafnekht resumed sway.

	B.C.
Tafnekht	720-718
Uahkere Bokenranef (Bocchoris)	718-712

25th Dynasty

Shabaka, who had been associated with Piankhi from about 715, now descended upon Egypt and recovered the Nubian ascendancy, founding the 'Ethiopian' Dynasty.

	B.C.
Shabaka	712-700
Shabataka	700-689
Taharka (Tirhakah) ..	689-664
Tanutamem	664-650

26th Dynasty

In the reign of Taharka Egypt was subdued by Esarhaddon and Ashurbanipal, successive kings of Assyria. Taharka and his successor made sporadic re-descents upon Egypt from Nubia or Thebes, but after some revolts and disturbances Ashurbanipal established Psammetichus at Sais. During this dynasty there was a brilliant revival of art and a last flash of military energy.

	B.C.
Psamtek (Psammetichus) I	663-609
Necho	609-593
Psamtek II	593-588
Uahibra (Hophra, Apries)	588-569
Aahmes (Amasis) II ..	569-526
Psamtek III	526-525

27th Dynasty

525-420 B.C.

Egypt conquered by Cambyses and ruled by Persian kings who assumed the old titles (see list of Persian kings in opposite page).

28th, 29th, 30th, 31st Dynasties

420-332 B.C.

Evanescent princes who succeeded in regaining some independence from time to time; Nectanebos, of the Thirtieth Dynasty, was Egypt's last native king. Finally the Persians regained complete control of the country in about 340 B.C., Darius III counting as the Thirty-first Dynasty.

The Ptolemies

305-30 B.C.

In 332 B.C. Alexander the Great wrested Egypt from Darius III; and his successors, Philip Arrhidaeus, Alexander II and the Ptolemies, among whom was Cleopatra (51-30 B.C.), ruled from Alexandria for some 300 years. Finally, in 30 B.C. Egypt became a Roman province.

KINGS & DYNASTIES OF MESOPOTAMIA

Traditional

Dynasties of kings, grading insensibly from mythical to actual, recorded at Kish (Semitic) and Erech, Ur, Uwan, Khamazi and Adab (Sumerian). Several kings are proved to be historical personages by discoveries of statues, mace-heads, etc. The overlordship shifts from town to town and dynasties are often contemporary. Kish usually predominant.

Dynasties at :

Maer c. 3103-2967
Akshak c. 2967-2868
Kish (3rd) c. 2967-2775
All three probably Semitic; last two probably contemporaneous

Lagash

Contemporary with the above, the Sumerian 'patesis' (priest-princes) of Lagash were often independent enough to style themselves kings; from them come our first contemporary records.

Enkhegal ?
Ur-Nina c. 3000
Akurgal c. 2950
Eannatum
Eannatum I
Entemena c. 2925-2795
Eannatum II
Enetarzi
Enlitarzi c. 2795-2790
Lugalanda c. 2790-2781
Urukagina c. 2781-2775

Erech-3rd

A prince of Umma now crushes Lagash and Kish, makes Erech his capital, and founds an empire over all Mesopotamia as far as the Mediterranean.

Lugal-zaggisi c. 2775-2750 B.C.

Agade

Sargon the Semite deposes Lugal-zaggisi and founds new capital at Agade. Ur-Bau (c. 2620) patesis at Lagash.

Sargon (Sharrukin) I c. 2750-2695
Rimush 2695-2686
Manishtusu 2686-2679
Naram-Sin 2678-2641
Shargallisharri 2641-2616
Six more kings 2616-2577

Erech-4th

Circa 2571-2542 B.C.
The last kings of Agade were feeble, and a dynasty of five kings now rules from Erech.

Gutium

Circa 2542-2416 B.C.
Anarchic rule of Gutian invaders, during latter part of which Gudea and Ur-Ningirsu are patesis of Lagash.

Erech-5th

A prince of Erech crushes last of the Gutians.

Utukhegal c. 2416-2409 B.C.

Ur-3rd

Last great Sumerian revival, and empire.

Ur-Engur (Ur-Nammu) c. 2409-2391
Dungi (Shuigi) 2391-2345
Bur-Sin 2345-2336
Gimil-Sin 2336-?
Ibi-Sin ?-2328

Isin and Larsa

In 2357 B.C. Ishbi-Erra, a Semite from Maer, made himself master of Isin and in 2328, in alliance with Elam, crushed the Ur dynasty. At about

the same time a rival Semitic dynasty arose in Larsa. Principal kings:

Ishbi-Erra (Isin) 2357-2325
Idin-Dagan 2315-2294
Ishme-Dagan 2294-2274
Lipit-Ishtar 2274-2263
Gungunum (Larsa) 2264-2237
Ur-Ninurta (Sumerian usurper, Isin) 2263-2235
Bur-Sin 2235-2214
Sumu-Ilu (Larsa) 2226-2197
Sin-idinam 2181-2175
Warad-Sin (Elamite conqueror, Larsa) 2167-2155
Rim-Sin 2155-2094

1st Babylonian Dynasty

In 2125 Rim-Sin, the Elamite king of Larsa, captured Isin; but in the meantime a Semitic Dynasty had arisen in Babylon and in 2094 its sixth king, Hammurabi, crushed Rim-Sin and ruled the whole country.

Sumu-abum 2235-2211
Sumu-la-ili 2211-2175
Zabium 2175-2161
Abil-Sin 2161-2143
Sin-muballit 2143-2123
Hammurabi 2123-2080
Samsu-iluna 2080-2042
Abesuh 2042-2014
Ammi-ditana 2014-1977
Ammi-zaduga 1977-1956
Samsu-ditana 1956-1926

Kings of the Sea Country

2070-1703 B.C.
In the reign of Samsu-iluna, Ilumailu founded the dynasty of the 'Sea Country' round the mouths of the Tigris and gradually absorbed large portions of the Babylonian domains. The Babylonian dynasty was brought to an end by the Hittite raid in 1926, after which follows an obscure period filled only by names of Sea Country kings.

Kassite Dynasty

1746-1169 B.C.
Kassite barbarians invaded the country and founded a dynasty at Babylon under Gandash in 1746. Their rival is now the growing power of Assyria in the north. Period of diplomatic relations with Egypt.

Assyrian Kings

Kings of Assyria can be traced back perhaps to 2400 B.C.; the two earliest, Ushpia and Kikia, being possibly Mitannians. Hitherto tributary to the empires of Ur or Babylon; but at this period they divide Mesopotamia with the Kassites. The first to make real headway against the latter was Shalmaneser.

Adad-nirari I 1303-1276
Shalmaneser I 1276-1256
Tukulti-Ninurta I 1256-1232
Ashur-nadin-apli 1232-1213
Ashur-nirari III 1213-1207
Enlil-kudur-usur 1207-1202
Ninurta-apal-Ekur I 1202-1127
Ashur-dan I 1175-1140
Ninurta-tukulti-Ashur 1140-1137
Mutakkil-Nusku 1137-1127
Ashur-resh-ishi 1127-1115
Tiglath-pileser I 1115-1102

Isin Dynasty of Babylon

1169-1039 B.C.
Under Ashur-dan the last of the Kassites had been suppressed, but a new dynasty from Isin arose in Babylon. Only the first few kings are important.
Marduk-shapik-zeri 1169-1152
Ninurta-nadin-shum 1152-1146

Nebuchadrezzar I 1146-1122
Enlil-nadin-apli 1122-1116
Marduk-nadin-akhe 1116-1100

A period of confusion follows; on the death of Tiglath-pileser Assyria relapses under pressure from Aramaean tribes, Babylonia from Chaldeans. A second line of Sea Country kings arises; and to end of Assyrian dominance Babylonia is ruled by a succession of powerless dynasties, Elamite or Chaldaean usurpers, Assyrian kings or Assyrian nominees.

Assyrian Empire

Under Adad-nirari II Assyrian power begins to revive.

Adad-nirari II 911-889
Tukulti-Ninurta II 889-884
Ashur-nasir-pal II 884-859
Shalmaneser III 859-824
Shamshi-Adad V 824-811
Adad-nirari III 811-782
Shalmaneser IV 782-772
Ashur-dan III 772-754
Ashur-nirari V 754-745
Tiglath-pileser III 745-727
Shalmaneser V 727-722
Sargon II 722-705
Sennacherib 705-681
Esarhaddon 681-669
Ashurbanipal (Sardanapalus) 669-626
Ashur-etil-ilani 626-621
Sin-shum-lisir 621
Sin-shar-ishkun 621-612

Chaldaean Empire

Nabopolassar the Chaldaean made himself master of Babylon in 625, allied himself with Cyaxares the Mede, and in 612 participated in the sack of Nineveh, thereafter dividing the Assyrian Empire with Cyaxares.

Nabopolassar 625-605
Nebuchadrezzar II 605-562
Amel-Marduk (Evil Merodach) 562-560
Nergal-shar-usur (Neriglissar) 560-556
Labashi-Marduk 556
Nabu-naid (Nabonidus) 556-539

Persian Empire

Astyages, the Median king, had wedded his daughter to Cambyses I, the Persian, then ruling in Elam. Their son Cyrus II, defeated Astyages in 550, took Babylon in 539, and inaugurated the Persian Empire.

Cyrus II, 'the Great' 558-529
Cambyses II 529-522
Darius I 522-486
Xerxes I 486-465
Artaxerxes I 465-425
Xerxes II 425-424
Darius II, Nothus 424-404
Artaxerxes II 404-359
Artaxerxes III, Ochus 359-338
Arses 338-336
Darius III 336-330

Seleucidae and Parthians

Alexander conquered the Persian Empire in 331; on his death it went to pieces, Seleucus, governor of Babylonia from 319, emerging as king of the eastern portions of his domains. This line lasted to 65 B.C., when its lands were annexed by Rome. But by that time most of Mesopotamia east of the Euphrates had fallen to the Parthians (Althridates I, 170-138 B.C.), who maintained their line with varying fortunes in opposition to Rome until the rise of the Sassanians under Ardashir I (Artaxerxes), a native Persian, in A.D. 212.

and by traditions in which we can recognize elements of truth plentifully wrapped up with fiction.

For predynastic Egypt only one approximately fixed date has been suggested. In reconstructing its story we must go back to a dim 'once upon a time'—say 2,000 years or so before the dynastic era. Lower and Upper Egypt, the Delta area and the Nile basin between the Delta and the cataracts, had both been long occupied by people in no sense primitive, when the conquering people who ultimately made Egypt broke in upon them.

Makers of the Dynastic Civilization

THE newcomers possibly came from Punt, the modern Eritrea and Somaliland, having racial affinities with the modern Somalis, not with the negro or negroid Nubians—perhaps we must seek for their ultimate origin in the East, on the farther side of the Red Sea. Without, however, abandoning the view that Egypt may have suffered incursions from the East in the predynastic period, we must give weight to the latest evidence which seems to show that these 'dynastic' invaders penetrated southwards from the Delta—see page 462. Their leader was by later generations called Horus, identified as the sky god whose symbol is the hawk. His great figure looms dim and tremendous through mists of confused legend and of countless years. We may, if we please, regard him as the inventor and originator of the idea and the institution of monarchy, the organized control of an obedient people by one man, accepted as wielding a divine authority; though more probably his personality is wholly mythical.

Although later traditions elaborated the Victories of Horus, no reliance can be placed upon them; they are too much mixed up with what is obviously mythological, and entangled with reminiscences of later wars. We can hardly even guess plausibly how many decades or generations or centuries passed before the followers of Horus were masters of all Upper Egypt. But we can be sure that two distinct kingdoms, the North and the South, were definitely established some centuries before the dynastic era began.

At about this stage we come upon what may be reckoned as the definite date mentioned above. These early Egyptians, in the Delta, had carried their study of the heavenly bodies so far that they adopted a calendar which gave the year 365 days; and this invention may perhaps have been made in 4241 B.C.

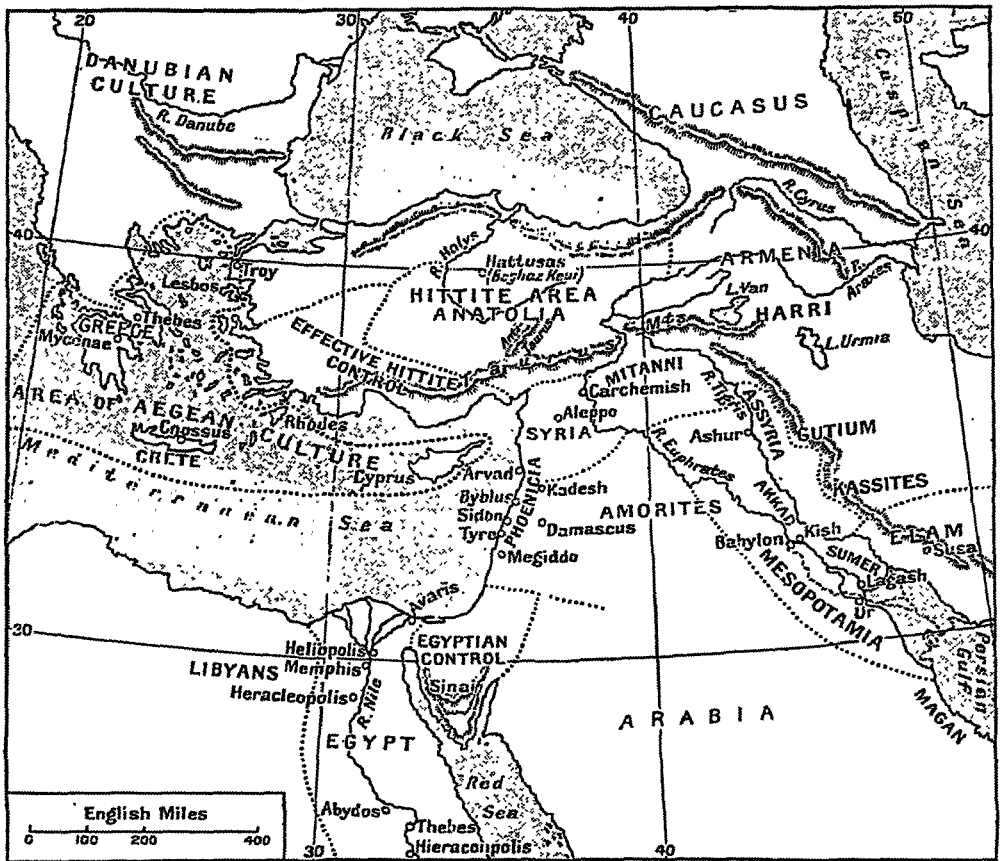
They reckoned twelve months of thirty days with five holidays over. But they did not put in a leap year to correct the error of a quarter of a day; so that new year's day in the calendar shifted one day from the astronomical date in four years, and the two did not coincide again till 365 leap years—1,460 years—had been missed. In the year A.D. 139 one such period, or 'Sothic cycle,' came to an end; and if we assume that the calendar had been in use for three cycles, this takes us back to the year named; though two cycles is as likely. Many centuries elapsed before the most advanced peoples adopted this early calendar, only correcting it by introducing the leap year.

Kings of Upper and Lower Egypt

It is probable that each of the two kingdoms of the North and of the South was a fusion of several minor kingdoms. Of persons and events we know next to nothing. We do know that their handicrafts belonged to the Age of Stone and were of an amazingly fine quality. Metal—copper—was only beginning to come into use; the tradition that the followers of Horus owed their victory to their metal-tipped weapons is probably a later fiction.

Centuries afterwards, under the Fifth Dynasty, lists of early kings were compiled, presumably from records of some sort; but they are names and nothing more. We are told nothing of what they did; nor do we learn more of them from the predynastic cemeteries which have been excavated. But we do know that the first king of the South, who joined the two kingdoms under his single sway not later than 3400 B.C., was officially and traditionally the descendant and the representative on earth of the divine or deified Horus.

Until the ancient monuments began to yield their records to the research and interpretation of modern Egyptology, our knowledge of ancient Egypt was derived



CRADLE LANDS OF THE WORLD'S EARLIEST ORGANIZED CIVILIZATIONS

It was in the valleys of the Nile and the Euphrates that advanced political societies first arose. This map gives the names and boundaries necessary for the understanding of their history down to 1580 B.C., but does not illustrate any single moment of that period. The nomadic Guitians and Kassites, for instance, were not pressing down into Babylonia from the indicated regions at the same time. For greater detail in each area, reference should be made to the maps under the study-chapters.

from the Hebrew scriptures, the traditions collected by the Greek inquirer, Herodotus of Halicarnassus, in the fifth century B.C. and the compilations of the Egyptian Manetho in the third century B.C., of which only fragments survive. That such information must diverge widely from the actual historical facts is a matter of course. What surprises the modern student is the extent to which it has been confirmed by the real contemporary monuments.

The king named Menes, who according to Manetho established the First Dynasty, was in actual fact one of the first of the long line of the Pharaohs; probably his legendary exploits are a combination of the historical accomplishments of the first three kings: the 'Scorpion,' Narmer and Aha Men (Menes), of whom we know

from the early lists or from contemporary remains. It is not always that individual kings on Manetho's dynastic list can as yet be identified; but the many identifications are a valuable endorsement of the traditions as a whole.

The northern kingdom was subjected not to the southern kingdom but to the southern king, who added the attributes of the northern king to his own and became Lord of the Two Kingdoms. He—or one of his immediate successors—refounded an ancient city, 'of the White Wall,' on the border, as a centre from which he could rule over both, though it was probably not until the Third Dynasty that it actually became the royal seat, and not until the Sixth that it was called the Egyptian equivalent of Memphis

The North does not seem to have acquiesced in the change tamely. Two more at least of the First Dynasty pharaohs record triumphs over the northerners, or easterners of the Sinaitic peninsula: Den Semti, and Semerkhet. The vanquished are portrayed as of a Semitic type markedly distinguishable from the Egyptian conquerors. War was also waged far to the south against the Nubians. The founding of Memphis is claimed anew for Enzib Merpeba. The appearance of the Second Dynasty a little later points to the passing of power to a northern family.

Organized Government 5,000 years ago

THE first two dynasties ruled for approximately 400 years. The second records no memorable doings, and ends with a fresh conquest from the South. The victor, Khasekhem, altered his name to Khasekhemui, married the heiress to the throne and became the progenitor of the Third Dynasty—the first Pharaoh of what is known as the Old Kingdom.

With Khasekhemui, provisionally dated about 2980 B.C., begins a series of mighty monarchs. His own statue has been found in his tomb in Upper Egypt at Hieraconpolis, the Hawk City, the centre of the Horus cult. Already an enormous interest attached to the burial place of the king, an interest presently responsible for the development of pyramid building.

The tomb of Khasekhemui is the first one to contain a complete chamber of hewn stone; his son Zeser, or Zoser, raised his entirely of stone, layer on layer, each layer smaller than the last, forming what is known as the first or 'step' pyramid. Sneferu, or Senefru, following Zeser after four reigns, filled up most of the terraces of his tomb at Medum, thus making a sloped instead of a terraced surface, though he did not add the completing cap. This is alternatively known as the first pyramid. After Sneferu came the great pyramid builders of the Fourth Dynasty.

The Egypt of which we have been speaking, Egypt before the third millennium, was a populous nation in an advanced stage of civilization. Of this the great tombs of the period at Abydos and elsewhere in central Egypt would be sufficient proof. Though we have to be satisfied with carven

monuments, Egyptian scribes were already writing their records on papyrus also. Great progress was evidently made in the four centuries of Menes and his successors and this must be largely attributed to the intelligent activity of the centralised government.

The government itself was highly organized. The southern kings introduced in the north the system of government by districts, 'nomes,' which had long prevailed in the south—relics probably of the early division into small kingdoms. The Pharaoh was the centre of all. Around him were the nobles, his personal friends and advisers. If he lived in magnificence and was laid in a magnificent tomb when he died, his life itself was strenuous enough. We see him leading his soldiers in battle, smiting the foe with his mace, cutting the first sod of a new canal, in his leisure time hunting game big and small.

The Pharaoh and his Duties

HE is an active administrator. He has been trained from his youth to take a responsible part in his father's rule—probably has been his chief minister. His accession to the throne has been celebrated with pomp and ceremony, and in his thirtieth year he will hold a kind of jubilee coronation, the 'Sed' festival. It may be that originally actual abdication or something still more drastic took place when a king had reigned thirty years, but this is at best doubtful.

His nobles are buried in mortuary chambers under a mass of brickery, the 'mastabas' from which the Third and Fourth Dynasties perhaps developed the pyramids. More than 5,000 years ago the virtues for which the dead had desired to be remembered by future generations were recorded in epitaphs which show a lively sense of the responsibilities of greatness, and indicate a high standard of public spirit.

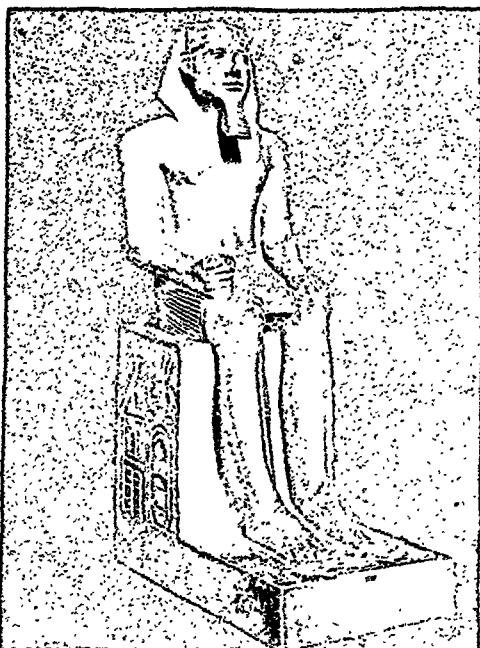
Zeser set to his successors the example of building himself two tombs, though in this he may not have been original. Like his father he was a warrior; he subjugated the Nubians, to some distance above the First Cataract. He also built temples of stone, but discoveries seem to show these had a stone-building technique behind them, and to bear out the tradition

that Neneter of the Second Dynasty was the first to use limestone for temple construction. The wealth of Egypt under Zeser is demonstrated by the immense amount of man power that could be absorbed in unremunerative labour without producing exhaustion; that exhaustion did not result is proved by the vast expenditure of his successors.

THE dynasty attained its zenith with its last monarch Sneferu. As a witness to his power he built at Dahshur (see map in Chap. 15) a second and nobler pyramid on a larger scale than his first—a complete one. He smote the Nubians. He brought the Sinaitic peninsula enduringly under the sway of the Pharaohs. He developed its copper mines, as Zeser had done before him. He created a flotilla of great Nile boats and sent ships to Phoenicia to bring back cedar-wood from Lebanon. The nobles of his day built their mastabas not of brick but of stone; and he left a name which was held in high honour centuries after his death.

SNEFERU left no son. Unless an ephemeral Sharu intervened, his successor was Khufu, the founder of the Fourth Dynasty, from Middle Egypt. Why he came to the throne we do not know; presumably his title was by marriage. Of his deeds, and those of his son Khafra and his grandson Menkaura, we know for certain only that they built the three great pyramids at Gizeh, and almost certainly the Great Sphinx. They are familiar to us by the names of Cheops, Chephren and Mycerinus, from the pages of Herodotus, who gathered traditions about them which contain more fable than history; though they reigned for twenty-three and fifty-six years respectively, he makes Khafra the brother of Khufu. The priests, who were his informants, had no good to say of either, though they lavished praises on Menkaura: they were tyrants and contemners of the gods.

From this we can fairly conclude that the priesthood and the monarchy were at odds in their day, but that under Menkaura there was a reconciliation; and it



EGYPTIAN RULERS WHO HAVE LEFT PROOFS OF THEIR WEALTH AND POWER

Very little is known of these two kings of the Fourth Dynasty, Khufu (2898-2875 B.C.) and Khafra (2867-2811 B.C.); yet the magnificence of their tombs demonstrates clearly that under them Egypt was at peace and extremely prosperous, and that the monarchy was absolute. For Khufu was the builder of the Great Pyramid at Gizeh, and Khafra of the larger of its two neighbours: works that could not even have been begun without an army of workers and vast resources.

Photos, Egypt Exploration Society and Mansell

is scarcely conceivable that the Great Pyramids should have been built without the exercise of a grinding tyranny. The biggest, the pyramid of Khufu, covers 13 acres; it is computed to consist of 6,000,000 tons of stone, in $2\frac{1}{2}$ -ton blocks hewn to shape with an extraordinary exactitude of angle and surface.

THAT it took—as Herodotus says—100,000 men 20 years to build it is probable enough. Those huge blocks had to be hewn in the quarries beyond the Nile, brought over the river and dragged up an inclined plane to the site of the pyramid. The enormity of the toil is almost unimaginable. The strain, both economic and physical, must have been terrific. On the other hand, the organization which

controlled such a vast mass of labour must have been amazingly efficient.

Khafra's pyramid was somewhat smaller than the other, with more apparent haste and less perfection in the workmanship. For both, the latest date is the twenty-ninth century. It is not surprising that, according to tradition, the land groaned under the burden, and the memory of the pyramid builders was held in abhorrence. The much smaller size of Menkaura's pyramid is evidence either of exhaustion or of the milder spirit of the Pharaoh.

The accession of the Fifth Dynasty would seem to mark the victory of priestly influence, and the supersession of the southern sky god Horus by the northern sun god Ra, or Re. Apparently the pharaonic theory of actual divine parentage was transferred to the offspring (according to the flesh) of Ra's high priest at On; the connexion at least is obvious in the personal names and the monumental buildings of the new dynasty.

Possibly something may be suspected of a phenomenon familiar in later ages, a blending of aristocratic and sacerdotal interests; for another departure from past custom is apparent. The great offices of state are no longer appropriated to the royal family; they become hereditary in the families of magnates. The germs of something analogous to medieval feudalism are beginning to appear.

USERKAF and Sahu-ra developed fleets on the Mediterranean and Red Seas, which sailed to Phoenicia and to Punt (Somaliland), and brought home the products of those regions—including slaves. Expeditions were sent to Nubia, and started the series of inscriptions above the First Cataract. The dynasty went on building pyramids, though by no means on the old scale. It could not afford to magnify itself after the old fashion, but was actively in search of new sources of wealth from commerce; while its dependence on the forces that had set it on the throne was raising the personal prestige of the nobility at the expense of that of the Pharaoh.

The policy of the Fifth Dynasty was carried out most effectively in the Sixth,



THIRD GREAT PYRAMID BUILDER

While tradition makes Menkaura, whom we see here with his wife, a great king, the smallness of his pyramid—the latest of the three at Gizeh—suggests that during his reign the resources of the realm were becoming exhausted.

From Boston Fine Arts Museum

in the fifty-three years' reign of Pepi I—if he actually reigned so long. He may have been a sort of Mayor of the Palace to his immediate predecessors, a powerful feudatory who succeeded to the throne unopposed. At any rate, he proved so adequate a ruler that two very young sons followed him, the second of whom, Pepi II, is credited with a reign of ninety-four years, the longest on record.

Pepi II began his reign as a child and ended it a centenarian, without having done anything in the interval to re-establish the royal authority. At his death we are probably in the twenty-fifth century. After it came the first of our two periods of anarchy. The 'nomarchs,' lords of the nomes, the dukes and counts of the Old Kingdom, became so many petty princes, defying the nominal kings of two very shadowy dynasties; till a Ninth Dynasty followed by a Tenth—perhaps contemporaneous with the Eighth at Memphis—was set up at Heracleopolis in Central Egypt by a group of nobles, who restored some local order at least, but only after irremediable damage had already been wrought. And the confusion was accentuated by an invasion of Asiatics from Syria.

Rise of Thebes & the Middle Kingdom

THE South, however, renounced allegiance to the Heracleopolitans; and after fierce wars a Theban house established the Eleventh Dynasty, the Middle Kingdom and the supremacy of Thebes—hitherto an unknown town, capital of a petty dukedom. Though the royal residence was for long at Itht-Toui for the sake of a better strategical position, and though later it was temporarily interrupted by the Hyksos, this supremacy was to continue for more than a thousand years. We date the first of the line—all the Eleventh Dynasty pharaohs were Intefs or Mentuhoteps—at the middle of the twenty-second century.

Two Intefs and four Mentuhoteps ruled for a century and a half. The great families would seem to have ruled very much on their own responsibility in their own provinces, while the royal authority preserved the public peace, revived the policy of internal development, and in the



ABLE RULER OF SIXTH DYNASTY

While probably not of royal birth, Pepi I (2595–2542 B.C.) proved a far-seeing and capable monarch. He carried out a wise domestic policy and a vigorous and successful foreign policy, which together ensured a century of peace in Egypt.

From J. E. Quibell, Hierakonpolis

time of Mentuhotep III warred against Libyans on the west, Nubians on the south and Sinaitic Semites. One noble was official Lord of the Marches in the south. Another was the Pharaoh's hereditary first minister; his house succeeded to the throne, probably not without opposition, on the death of Mentuhotep IV, inaugurating the Twelfth Dynasty of Amenemhets and Senusrets—of which the Greek form Sesostris is more familiar.

This dynasty ruled in power and splendour from about 2000 to 1788 B.C., if we accept the latest possible dates. Amenemhet I survived sundry conspiracies—presumably the work of jealous aristocratic factions—against his own life, and in his thirty years' reign fully established, not at first the old-time despotism, but the very effective supremacy of the crown, so long as it was worn by a strong and capable ruler.

EGYPT then, under the Twelfth Dynasty, enjoyed two centuries of prosperity. The succession was secured, with one exception, by the association of the crown prince with his father formally as joint king, during the father's life. The climax of power was attained under Senusret III, and of splendour under

Amenemhet III. The southern border was definitely carried beyond the Second Cataract. Egyptian armies raided Syria, though the tradition of a conquest is mythical. The prestige of the throne was raised when a Senusret fought victoriously at the head of his troops as in the ancient days.

GREATER, however, than the renowned achievements of Senusret III in war were those of his son Amenemhet III in peace; for it was he who developed the regulation and distribution of the waters of the Nile in upper Egypt, and practically created a new highly productive province by transforming Lake Moeris in the Fayum into a vast reservoir for irrigation purposes (see page 546). None of the Twelfth Dynasty rulers neglected the development of the wealth and resources of Egypt; but no other accomplished so much.

The great dynasty had succeeded in once more centralising the sovereignty, and reducing the personal power of the nobles, replacing it with the administrative authority of crown officials; so that government could carry on peacefully and

automatically unless subjected to a strain which called for exceptional capacity in its head. But the line ended—strangely enough for Egypt, with a queen—a few years after the death of the great Amenemhet. The new dynasty and its successor lacked the capacity of that which had passed; the second interregnum of anarchy began, with the kingship split into rival houses at Thebes and Itht-toui; and the whole system went to wreck with the Hyksos invasion, early in the eighteenth century.

WE have now followed the course of events in Egypt for sixteen hundred years, a period equal to that which has elapsed since the Romans were in Britain. Yet if we cast our eyes over the rest of the world to glean material for historical narrative, black darkness still meets us everywhere—with one exception. It is true that the archæologist has recovered the material evidence of considerable cultures from sites all round the Mediterranean, especially in Crete and the Aegean, and has equated their development with Egyptian chronology; but



WARRIOR-KINGS WHO REVIVED THE POWER OF EGYPT

After three centuries of disruption (2430-2160 B.C.) Egypt recovered cohesion under a series of strong and beneficent rulers. It was Mentuhotep III (left; circa 2078 B.C.) who really united the country and made it strong within. Senusret I (1970-1935 B.C.) greatly enlarged his dominions by conquest in the upper Nile valley; and Senusret III (1887-1849 B.C.) was even more successful in his wars, as his victorious armies not only subjugated neighbouring tribes but penetrated into Syria.

Photos, R. B. Fleming, Sir Flinders Petrie and W. F. Mansell

of records that the historian can chronicle there is nothing. The interpretation of the discovered remains is, therefore, reserved for our study-chapters; Chapter 19 deals with the Mediterranean and notices the Hittites, while Chapter 20 does a like service for more backward Europe.

As for the Hittites, that mysterious people of Asia Minor whose power has only lately been revealed, their entry into world history is more properly a subject for the following Chronicle, and their polity is accordingly described in one of the chapters thereto annexed. But one or two definite events that may be referred to this period emerge from a study of their archives discovered at Boghaz Keui, and from the records of neighbouring powers. Thus the first king of whom we find mention—Pamba—lived about 2750 B.C., but he seems only to have ruled a petty state. It was not until about 2000 B.C. that Hattusil I made Hattusas the capital of a considerable kingdom with its boundaries on the Mediterranean, while the sack of Babylon by the Hittites may be fixed at about 1926 B.C. (see below).

Dawn of History in Mesopotamia

FOR the civilizations of India and China a high antiquity has been claimed, but research does not support the claim. China was, no doubt, ahead of her neighbours in material culture, and something of the main lines of progress can be inferred from later knowledge; but the bulk of India, save for culture stations of Sumerian affinities, such as Mohenjo-Daro and Harappa in the far north-west, does not seem to have been above the general level. Probably the first wave of Aryan immigration began some time during our period. America we can safely assume to have been still in the hunting stage of barbarism, in spite of exaggerated estimates of the age of Inca and Maya civilizations that have sometimes acquired credence. The whole problem of the conditions attending the rise of civilization in these several areas is reviewed in Chapter 14.

The one exception of which the historian can take advantage is Mesopotamia. Here,



BUILDER OF EGYPT'S PROSPERITY

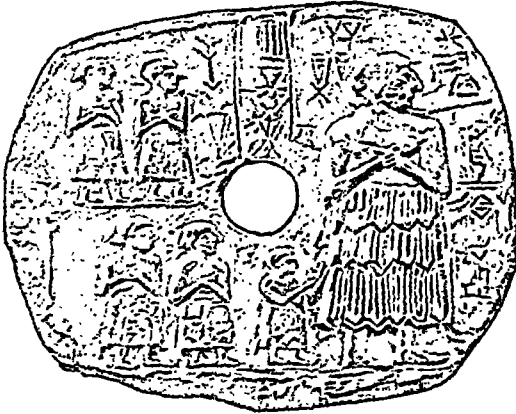
One of the most enlightened of Egyptian rulers was Amenemhet III (1849-1801 B.C.). His strong, centralised government maintained peace, while his brilliantly conceived public works led to an increase in wealth.

Courtesy of Sir Flinders Petrie

during all these centuries, a civilization was developing, and records being made in an elaborate script, without any contact with Egypt other than cultural through the medium of trade; for chronology will not support a theory that an early king (Naram-Sin) met Menes in battle. It is possible, however, that some of the early predynastic invaders of Egypt may have originated in this area (see page 422).

As in the Nile basin, the beginning of recorded history can hardly be dated earlier than the second half of the fourth millennium B.C., probably about its close; but from known conditions when the records begin, from earlier relics and from traditions, something of the preceding two thousand years may be inferred, though little can be positively affirmed.

The name Mesopotamia applies generally to the whole district lying between the rivers Tigris and Euphrates. The land about the two rivers between the modern Bagdad and the Persian Gulf may be distinguished as Babylonia; in those ancient days the rivers entered the gulf by separate mouths, the sea having



BABYLONIA'S FIRST WELL KNOWN KING

Ur-Nina, king of Lagash, is the first real personality to emerge in Babylonian history. He stands here wearing the Sumerian flounced 'kaunakes' imitating a sheep's fleece, with his butler, Anita, and a group of his sons.

From the Louvre

probably since then receded some two hundred miles. Beyond the Tigris rose the mountains of Elam. West and south of the Euphrates spread the Syrian desert. West of the desert and the upper waters of the Euphrates plain came what were known later as Syria and Phoenicia; and beyond the mountains of the Taurus and Anti-Taurus, on the north and north-west, the highlands of Anatolia and Armenia.

UR beginnings, then, are in a Babylonia where as yet there is no Babylon. In the dim twilight centuries we discern the presence of Semitic peoples and—whether later comers we do not know—Sumerians, a folk akin, it may be, to the Dravidians of India. Sumerians predominated always in the southern portion, Sumer; Semites generally in the northern, Akkad. They were city dwellers and tillers of the soil; they exchanged produce; they had begun at least to work copper and make tools of copper; the Sumerians at least had developed a script on lines of their own.

Their cities make war on each other; one is now predominant, now another; tradition tells of dynasties at

Kish in the centre, Akshak in the far north, Ur and Erech in the south, to say nothing of mythical predecessors. Their chiefs claim a dubious kingship over the rest. Most commonly the ascendancy rests with Kish and its apparently Semitic dynasties, so that the very word 'kish' came to mean Universal Dominion, until a century or so before or after 3000 B.C., when the historical contemporary records of the Sumerian city of Lagash begin with its king Ur-Nina.

BEFORE this date there are indeed inscribed remains that enable us to grope through the centuries, such as those of A-anni-padda of the First Dynasty of Ur—prehistory grades into history much more gradually here than in Egypt; but at Lagash occur the first long inscriptions from which we can reconstruct anything like a narrative of events. It seldom seems to have been a city of first-rate importance, but its intellectual influence was great and by chance it is the one about which we know most at this stage.

The first monument we have, that known as the Stele of the Vultures, belongs to the reign of Ur-Nina's grandson Eannatum (about 2900 B.C.). Primarily, it commemorates the victory of Lagash over its neighbour Umma, but this warrior claimed also to have waged successful wars with other cities, Ur and Erech, to have smitten the Elamites—a people of ancient culture on the east—and to have vanquished Kish. The most distinguished



EANNATUM OF LAGASH IN CONQUERING GUISE

A fragment of the so-called 'Stele of Vultures' gives us a picture of Eannatum, grandson of Ur-Nina, leading a phalanx of heavy-armed Sumerian spearmen in one of the perennial feuds between Lagash and Umma. Lagash was victorious; and Eannatum claims to have vanquished Kish as well.

From the Louvre

of his successors at Lagash were Entemena and, after an interval, Urukagina, who was remarkable as an economic reformer. With him, however, the independence of Lagash ended. He was overthrown by the conqueror Lugal-zaggisi of Umma, who transferred his capital to Erech and claimed to have carried victorious arms from the lower sea (the Persian Gulf) to the upper (the Mediterranean).

THEN he in his turn was overthrown by Sargon of Agade, who, followed by his sons, set up a Semitic empire, traditionally dated in the twenty-ninth and twenty-eighth centuries. The Assyrians of later ages looked back upon Sargon as their first national hero.

As happened with so many other national heroes, legends gathered about the birth, youth and upbringing of Sharrukin or Sargon. Obviously he was not a king's son. Having achieved kingship, he reigned for fifty-five years, conquering all lands 'from the rising to the setting of the sun.' He crossed the eastern sea and smote the Elamites from the south. He marched to the western sea, subduing the Amorites (i.e. 'westerners'). He crossed that sea, though whether this means that he visited Cyprus we cannot be sure.

He had begun his career of victory by overthrowing the mighty Lugal-zaggisi; he ended it with half of his empire more or less in revolt, but still unable to make head against him successfully. The traditions concerning him were very early, and very firmly established, and his own inscriptions mention expeditions to the 'silver mountains' which can only mean the Taurus and its silver mines, and to the cedar forests, certainly Lebanon.



NARAM-SIN

For Naram-Sin of Agade we have a portrait from the stele set up to commemorate his victory over the mountaineers in the lands beyond Tigris.

From the Louvre

Two sons, Rimush and Manishtusu, followed Sargon and maintained his empire, not without much fighting against rebellious chiefs. The next, the illustrious Naram-Sin, passed into tradition as a third son, but as he reigned at least thirty-eight years this scarcely seems likely; and indeed the latest discovered king-list makes him the son of Manishtusu.

The most valuable contemporary monument of Naram-Sin is that known as the Stele of Victory, which commemorates his triumph over Lulubu (trans-Tigris). It would seem that at an early period he overthrew nine armies and carried captive three kings, in chains; that he conquered Magan, probably on the Arabian shore of the Persian gulf; that Kish, forgetting that she owed her liberation from the Sumerian overlordship to Sargon, ungratefully headed a rebel confederacy against Naram-Sin, and paid the penalty for so doing. Naram-Sin also reasserted his authority in the west, where it can never have been very firmly established, and very possibly carried his arms through the passes of the Taurus and Anti-Taurus into Anatolia and Armenia.

Some predecessors in what may be called the high-kingship had adopted the swelling title of King of Universal Dominion; for which Naram-Sin substituted King of the Four Quarters of the World, subsequently appropriated by the Babylonian monarchs whose city had not hitherto attained a general supremacy.

The Coming of the Gutians

NEXT came Shargalisharri, once thought to be a grandson but probably a son of Naram-Sin. The records of his reign are meagre, but he seems to have been troubled by the same sorts of revolt as his predecessors. At any rate, he too smote Elam on the east and the Amorites in the west.

We find him moreover at war with Gutium in the north-eastern mountains, whence a barbarian flood was presently to inundate Babylonia, though for the time it was held back. Probably the torrent overwhelmed Shargalisharri's successors, for the dynasty flickered out with a brief

series of names and nothing more, and the kingship melted away among the 'hosts of Gutî which had no king,' as the dynastic lists put it.

The Gutian invasion and domination were very destructive of monuments and records, as of other things. In fact they had kings, but they probably left the local administration to run very much as it had run before under the local princes, who combined the functions of priest and ruler and bore the same title of 'patesi' which in the past they had borne except when the extended domination of a particular city, Kish, Ur or Erech, had entitled its patesi to claim the higher kingly title now appropriated by the Gutians.

Herald of a Sumerian Revival

BUR like other barbaric hordes the Gutians were not organizers of empire. The older culture was temporarily submerged but not destroyed; and presently there appears the distinguished figure of Gudea, patesi of Lagash—still a vassal of Gutium—under whose beneficent rule justice, prosperity, religion and the general concomitants of a wise government once more prevailed.

Our dates are very doubtful; but if we place Shargalisharri in the second half of the twenty-seventh century B.C., Gudea will come in the middle of the twenty-fifth. He prepared the way for Sumerian revival. Shortly after his time the Gutians were ejected from Babylonia, by a prince ruling at Erech; and then the ancient city of Ur once more becomes an imperial capital.

In the course of a long reign Dungi of Ur, whose father Ur-Engur (or Ur-Nammu) had established his supremacy in Sumer and Akkad, conquered Elam, extended his sway over upper Mesopotamia, and probably attached the flourishing Babylonian colony in Cappadocia to his empire. Yet the power of the dynasty hardly survived Dungi; it was overthrown by a disastrous Elamite raid; and the somewhat feeble sceptre passed for just two hundred years to an undistinguished dynasty at Isin, until Semitic conquerors, newcomers to the Two Rivers, set up the first ascendancy of Babylon.

Probably we must assume a prolonged and persistent penetration, rather than a conquest, by 'Amorites'—that is, Semites from the trans-Euphrates, west of Mesopotamia. At any rate at the close of the Isin dynasty we find its most prominent rivals at Larsa, whose lords bear Semitic names, and in the rising power of Babylon under foreign Semite rulers; complicated by the secular feuds and occasional alliances with Elam.

The Babylonian dynasty was established by Sumu-abum, in the days of Bur-Sin of Isin and Sumu-ilu of Larsa, probably about 2225 B.C. Half a century later, the Larsa dynasty was overthrown by the king of Elam; and some years afterwards, with the accession of his second son Rim-Sin—an Elamite though he bore a Semitic name—the struggle for supremacy was inaugurated by that ambitious chief. In the course of twenty years Rim-Sin gradually absorbed his neighbours' territories till he had conquered Isin itself, though once he suffered a reverse at the hands of Sin-muballit of Babylon. And then he met his match in Sin-muballit's son, the great Hammurabi.

Hammurabi and his Triumphs

IN his first years Hammurabi dealt firmly with Rim-Sin, who had to surrender most of his acquisitions to that Babylonian Alfred the Great. In the forty-two years of his reign he established a vast and well-ordered empire; but his greatness lies in the fact that his aim was not expansion by military exploits so much as unification by peaceful organization.

After he had defeated and bridled the elderly aggressor of Larsa, we hear little of war and battle for many years; but we have indications that his authority was accepted all over Mesopotamia and that only small bodies of troops were needed for its enforcement. At the close of his reign or near it he had to suppress Rim-Sin finally and thoroughly, and to send expeditions to Elam. He must have been involved in other military activities, of which perhaps we have a glimpse in the biblical story of Abraham—if, as seems not unlikely, Amraphel of Shinar stands for Hammurabi.

His grand work, however, was in the system of administration which culminated in the famous Code. The laws of Hammurabi were not his own invention ; they are a codification, shaping into one harmonious whole a multitude of laws and customs already in existence, and no doubt modifying them. But the codification is an epoch in the science of government.

A SLOW disintegration set in after Hammurabi was dead. No one of his line, progenitor or descendant, approaches this greatest known personality among the rulers of the oldest civilizations. None of this dynasty seems to have been a fighting man by choice ; but no oriental empire had ever preserved a prolonged sway without periods of energetic militarism.



GUDEA THE BENEFACTOR

Gudea was a prince and benefactor of Sumerian Lagash during the Gutian domination. He represents the end of the old order in Mesopotamia, just as the great lawgiver Hammurabi, sixth king of the Semitic First Babylonian Dynasty, typifies the new.

From the Louvre



HAMMURABI THE LAWGIVER

Hammurabi is separated from Gudea by the short-lived empire built up by the kings of Ur, Sumerian in name at least but largely Semitised. He is here seen on a stele set up by one of his officials as a dedication to a goddess.

From the British Museum

The dynasty of Hammurabi lost grip. Among the marshes that were steadily encroaching on the head of the Persian Gulf there grew up a ' Kingdom of the Sea Country ' which was in frequent conflict with the successors of the great king. It lay on the lower Tigris, since the Babylonians tried to flood it out by damming that river ; but one of its kings, Iluma-ilu, came near to obtaining control of the whole country. The mountains on the east were full of tribesmen who were more than ready to take advantage of any signs of military weakness among the plain-dwellers—in 2072 B.C. there was a Kassite raid that caused five years of confusion. Behind the mountains of the west were surging the hordes of the Hatti or Hittites—a menace to upper Mesopotamia, where it can never have been easy to maintain a firm control from a centre in Babylonia.

Some century and a half after Hammurabi's decease, the dissolution of the dynasty was brought about by the devastating Hittite raid already mentioned, which left the power of Babylon shattered and helpless. The actual course of events is extremely uncertain ; but the next

apparently indisputable fact is the establishment of a Kassite dynasty at Babylon by the conqueror Gandash, who assumed the old title of King of the Four Quarters of the World, about the middle of the eighteenth century—a date not far removed from the latest assigned to the Hyksos invasion of Egypt, in the earlier half of that century.

Dark Age in Egypt and Babylonia

THERE would seem to have been an interval of nearly two hundred years, according to Assyrian documents, between the fall of the Babylonian dynasty and the Kassite conquest; an interval filled in only by the names of rulers in the Sea Country, and at Ashur (in Assyria), but without any record of events. On this basis the accepted date for Hammurabi is 2123-2080 B.C. Some authorities, however, mistrusting the Assyrian evidence, will admit no gap, and date Hammurabi 1944-1901, the date 1746 B.C. for Gandash being practically fixed. Almost certainly this is too low, but recent evidence seems to date the beginning of the Babylonian dynasty to 2169 B.C.—which would place Hammurabi's accession in about 2067. Until further confirmation, however, it is safer to follow the accepted chronology.

For some centuries following the close of the Twelfth Dynasty in Egypt and of the Hammurabi Dynasty in Babylon, the chronicle of both regions is involved in obscurity. The records we have are of later date, and are not easily reconcilable. The mists will rise again in Egypt at a date of which we are assured within a year or two—1580 B.C.—with the expulsion of the Hyksos and the founding of the Egyptian Empire; in the Euphratic region they are hardly dispersing till about a century later.

In both regions the obscurity is in part the outcome of the incursion of a foreign element which breaks up the existing political system, but passes away without leaving any other permanent mark of its own. In both regions the date of the actual catastrophe is uncertain; but we can at least be fairly confident that in the eighteenth century—probably during the first half—Semitic rulers from Syria,

known as the Hyksos, established themselves in the Nile Delta; and that in the middle of the same century a dynasty known as the Kassites established itself at Babylon.

The Kassite conquerors were rude barbarians from the eastern mountains. Though their royal family ruled for nearly six hundred years, bearing names which were not Semitic nor Sumerian, but sometimes apparently Indo-European, their tribes never formed more than a fraction of the population into which they were absorbed. Under their rule, Babylon by slow degrees recovered something of her old ascendancy and claimed the old high-sounding titles.

The Kingdom of the Sea Country faded out and was absorbed; Ashur (Assyria), on the upper Tigris, paid homage to Babylon which was little more than formal. In upper Mesopotamia the independent power of Mitanni appears firmly established when the mists rise; its sway never extended over the Amorites, the trans-Euphrates Syrians and Phoenicians of the west. The Hittites had not followed up the devastating incursion which shattered the old Babylonian dynasty; it was in the coming centuries that they were to make their bid for rank among the civilized powers of the ancient world.

Egypt invaded by Foreigners

FOR the Nile Region the later Egyptian compilers enumerate five dynasties between the Twelfth and the Eighteenth, which founded the Empire: three legitimate and two foreign, the latter being counted as the Fifteenth and Sixteenth. On the latest-date calculation, they are crowded into 208 years. The two Hyksos dynasties must be regarded as contemporary with two of the other three; but we must still assume a large proportion of very short reigns and a rule divided between simultaneous claimants to the pharaonic dignity, if we have to compress the three Egyptian dynasties into barely two centuries.

The points which seem clear are these. The weak pharaohs of the thirteenth dynasty were ejected from the Delta by foreign invaders; but they and

their successors were permitted to maintain at least a show of authority in Upper Egypt, though they eventually became tributaries of the Hyksos.

The Hyksos were certainly of Semitic speech; presumably they were a horde or confederation of pastoral nomads from Syria, of whom the Israelites or Hebrews may just possibly have been a section that either before or after the invasion settled in the Delta, but was retained in its settlement at the time of the expulsion. The one novelty that Egypt owed to the invaders—for future use—was the war-horse and the war-chariot. Their domination was wholly destructive, though their later monarchs found themselves unable to resist the immemorial influences of the country. Tradition, of course, denounced them as infidels, brutal tyrants and oppressors.

The much later Jewish identification of the Hyksos as a whole with the Hebrew tribes is untenable, though we may recognize an intimate legendary connexion between the sojourn in Egypt and the Hyksos occupation. Uncertain also is the theory that the name is to be translated 'shepherd kings,' which is appropriate enough if they were a horde of pastoral nomads, but may very possibly be only an ingenious etymological error. 'Princes of the Deserts'—in other words, Beduins—is a more probable interpretation. A name easily identified as the Semitic Yakub (Jacob) is found among the Hyksos king lists, but it obviously has no connexion with the Hebrew patriarch.

The Hyksos and their alien Rule

THE Hyksos formed a great armed camp, garrison or fortress at Avaris—a position on the east of the Delta which cannot be exactly identified—so that they might dominate Egypt from it and at the same time control their Syrian empire or confederacy, concerning which we have no further information. Their mightiest ruler was Khian, who took the title which means 'Embracer of Territories,' besides a regular pharaonic throne name. Under him and his successors there was probably

no independent Egypt in the south. Relics of him are found as far afield as Crete and Babylonia, though of a kind which suggests that they may very well have been merely spoils carried off thither at a much later date.

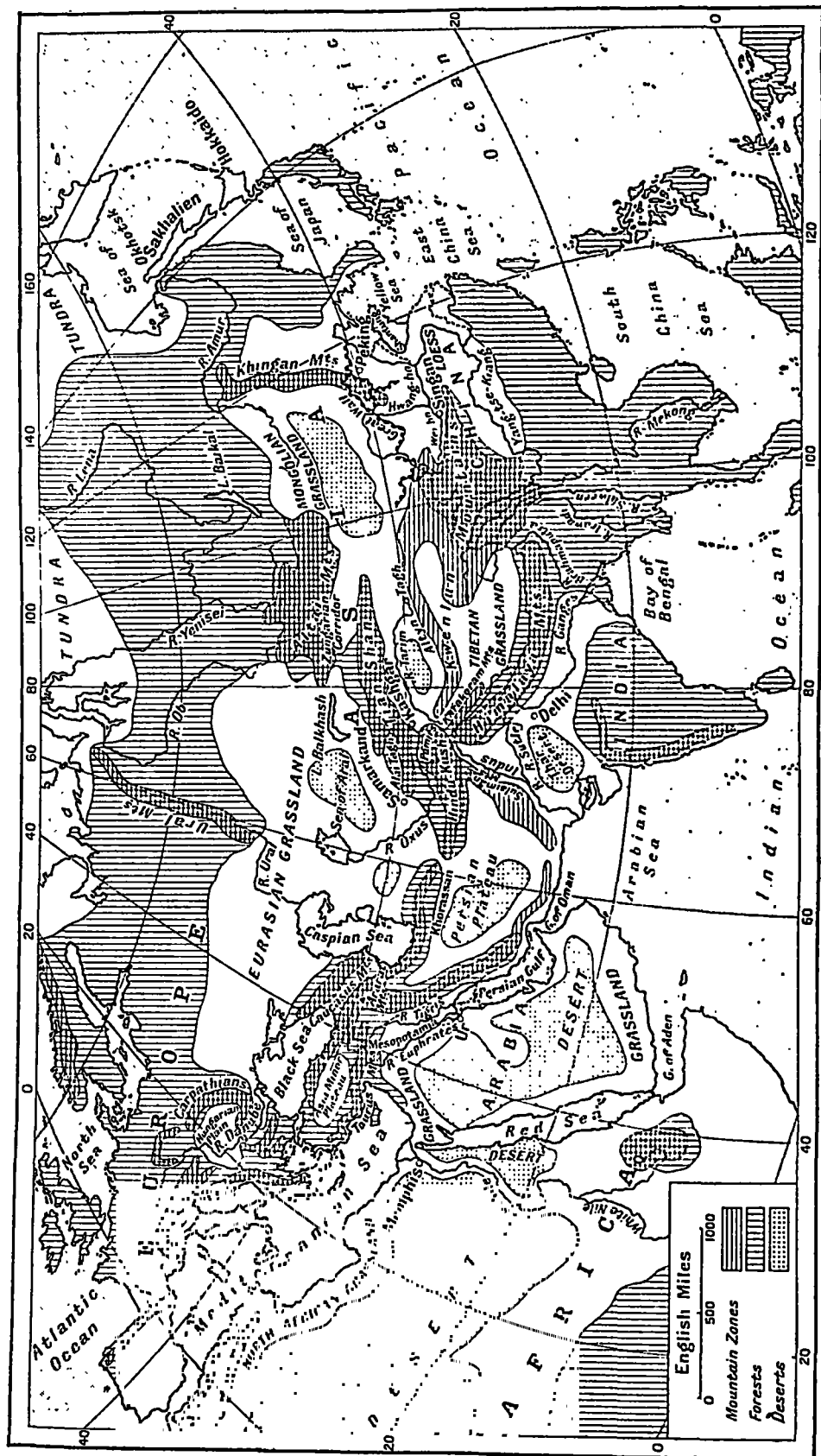
Towards the close of the seventeenth century, the Seventeenth Dynasty was reigning in Upper Egypt at Thebes, which had probably regained a measure of independence under Sekenenra I, but was still vassal to the Hyksos over-lord Apopi III in the Delta. Apopi, says tradition, sent word that he was annoyed by the roaring of the hippopotami in the realms of the king Sekenenra III. No doubt the envoy spake a parable. Sekenenra took alarm; he revolted, and the revolt developed into a war of liberation.

Egypt's War of Liberation

PATRIOTISM rallied to the daring rebel, and when he himself fell fighting—as testified by the wounds on the dead man's skull, which is preserved—it did not desert his young sons. Though tradition describes the war as a long one, its conclusion was achieved within twenty years by the third and youngest of them, the still youthful Aahmes. In the final stage, Memphis had been captured and the foreigners were besieged for three years in Avaris.

It is significant of the difficulties under which the patriots laboured that, during the prolonged siege, the Nubians in the south revolted in conjunction with some Egyptian nobles. So grave was the peril that the young king left the siege in person to lead an expedition against the rebels. His success was swift and complete; he returned to the siege with all a victor's prestige; and Avaris fell. The Hyksos army was driven over the border or cut to pieces, and the Hyksos vanished from the land they had plagued so long.

Egypt was once more free, and with the establishment of the Eighteenth Dynasty a new era commences. In Mesopotamia, however, the Kassites were still ruling; obscurity besets the records on every hand, and Assyria had not yet felt her power.



GEOGRAPHICAL DISTRIBUTION OF GRASSLAND AND FOREST IN THE OLD WORLD AT THE DAWN OF CIVILIZATION

An attempt is here made to show, from a purely human point of view, the geographical conditions attending the rise of the earliest civilizations. The important features for the history of man were open country (grassland with parkland fringes); difficult country (forests and deserts); and impassable barriers (forested mountains). Forests are shown cloaking many regions whence they have subsequently been cleared; and in those far-off days the climate was damper, so that grass covered much that is now desert and most mountains were forest-clad. Only those mountains are given that were significant for human movements, irrespective of height; notice also the coast-line alterations of North China and the Persian Gulf.

THE RISE OF ORDERED CIVILIZATIONS

The Clash of Cultures and its fruitful
Stimulus to the Progress of Human Society

By J. L. MYRES

Wykeham Professor of Ancient History, Oxford University; Author of
The Dawn of History, etc.

AN attempt has already been made (see Chap. 9) to discover the geographical distribution of historical interest; to answer, that is, the question why the greater advances towards civilization have occurred in particular regions and among certain physical surroundings; and why, on the other hand, some regions, such as the frozen Arctic lands and the sodden tropical rain forests, have not given rise to any such mode of organized advancement.

In the course of that inquiry, it became evident almost immediately that one of the principal reasons for the failure of mankind to gain the upper hand in its struggle with physical surroundings such as those, was that safety there lies not in numbers but in the smallest and most temporary groupings compatible with survival—that is, with the replacement of older by younger individuals. Co-operation leads to overpopulation, because it means additional mouths to be fed from natural and local resources which Man is unable to increase, either not knowing how or not daring to risk starvation by remaining near his seedlings or cuttings till they have fruited.

At the other extreme, all the regions in which civilizations have arisen have been regions of relatively dense population, made possible solely by exceptional facilities for the production of food, and itself making possible the realization of projects requiring the co-operation of many hands. The survey in Chapter 9 of the geographical distribution of climates, and especially of rainfall and consequent supply of river-water, showed the regions actually occupied by dense populations of this kind to be few in number and strictly controlled by

the physical circumstances required for the production of a still more restricted list of food-crops: the marsh-grass, rice, in the monsoon regions of southern and eastern Asia; maize in sub-tropical America; and the 'nobler grasses,' wheat, barley, millet and the like, on the grass-land margins of the Old-World desert belt, and in parts of north India and north China.

But mere abundance of food-supply artificially stimulated and extended by human industry and skill, though it is a necessary condition for relatively dense populations, is not sufficient to permit the advance to a highly civilized mode of life. It allows men to live in greater numbers, and with greater security against want; but it does not necessarily liberate them from the preoccupation of their daily, monthly and yearly task of supplying this elementary need for food.

In this respect, we have seen reason already to contrast the perennial toil of the rice growers, in which there is practically no off-season, with the intenser but intermittent *Leisure hours of labour of the growers of the wheat farmer* maize and still more of wheat. Moreover, the heaviest part of wheat farming is transferred from the people themselves to their draught-animals, leaving large seasons of the year comparatively free for other enterprises; within a range of climate, too, where, as has been said, 'it is seldom too hot for men to think with a view to action.' In such conditions, experience not only accumulates but is subjected to reflection, criticism, interpretation; improvements are not only imagined in intervals of leisure, but tested by foresight and experiment;

and the social organization necessary for the performance of the more complicated sequence of tasks permits a degree of habitual intercourse, and intelligent teamwork, which supplies the mechanism and mobilisable man-power for far larger enterprises than are practicable among the scattered and preoccupied rice growers.

But neither accumulated experience nor intelligent team-work, nor the combination of these, which is illustrated in early stages

of all the great civilizations, is sufficient to account for the contrasts among these rare and exceptional manifestations of Man's dominance over his surroundings. The application of experience to satisfy needs presumes a thinker, a discoverer, an innovator; the direction of willing workers to constructive tasks postulates leadership as well as originality; it is when the ordinary man is most at a loss, in face of fresh and unforeseen occurrences, that genius finds its opportunity. In familiar phrase, 'necessity is the mother of invention.'

It is in this sense that history has been described as the study of the doings of great men. And the common habit, of those peoples whose achievements count for most in the history of mankind, to attribute their exceptional fortune to the personal initiative of a 'culture-hero' seems to be grounded on experience; though it is seldom possible to demonstrate by historical research the occasion or the precise character of his doings.

The great majority of human societies (see Chap. 5) owe their continuous existence to a mode of life and a system of social institutions which are stable and very hard to change. Occasionally it is possible to discover when and how such habits and customs originated; but usually all that can be said, either by the people who hold them or by scientific enquirers, is that as far back as knowledge or memory reaches things have been so; with the further opinion on the part of the people themselves that they are best left 'as they have always been.' That is to say, in such societies adjustment has been reached between available resources and realized needs; if discomfort or want is felt, it is accepted as inevitable, and is

frequently explained as a retribution for some breach or other of the established order, not as the result of the people's own failure to adjust their behaviour to their actual circumstances.

While the quality and behaviour of simple societies thus apparently tend to be stable, their size, and the number of tribes or other units which occupy a natural region, seem also to be constant, in the absence of some disturbing factor. But in the reasons for this Man differs from other living things, which breed in the wild state without restraint and are restricted to their actual numbers by a 'struggle for existence' in which a large proportion of each brood is destroyed prematurely. In the simpler human societies overpopulation is avoided more deliberately, either by postponement of marriage and other forms of restraint or by more or less systematic infanticide.

In societies thus accommodated to their regional surroundings there is, as has been said, no more place for a 'great man' than for a 'great ape' or a 'king lion,' to reform the specific behaviour of his kind and start them on a new phase of well-being; and it is difficult to see how such equilibrium can change, in the absence of some external cause of disturbance.

On the other hand migrations of peoples do occur, both on minute and on very extensive scales. And since such migrations of one community into the region occupied by another are among the most obvious, and also the most common, causes of the dislocation of habitual equilibrium, it is necessary to ascertain both the reasons for such movements and the opportunities for them, before enquiring into their results in the migrating groups themselves, and into their effects on the societies among which such immigrants are intruded.

In the first place the geographical distribution of climate and vegetation is not fixed; and although its changes are for the most part very gradual, they are occasionally rapid and far-reaching. Such changes may be progressive for long periods, like the advance or retreat of an ice age over North America or north-western

Europe; or they may oscillate through a comparatively short cycle of phases, like the spells of hotter or cooler, wetter or drier summers, which may be recognized through the statistics of wheat production since such records were first made.

Obviously such oscillations affect most appreciably those areas where a small change, in the rainfall for instance, makes all the difference between pasturable grassland and mere desert; and as the wholesale destruction of plant life by a very few dry seasons may take a long while to repair, it is among the pastoral peoples on such grasslands that the effects of climatic changes produce the most violent disturbances, seeing that they are at all times on the move between summer and winter grazing grounds and have least difficulty in shifting themselves and their flocks and herds to districts less severely affected by the drought.

But the grasslands, vast as they are, have their limits, and these limits to easy progress are set less by mountain barriers than by belts of forest where the cattle stray out of sight and are destroyed by beasts of prey; where, moreover, other men live, hunters to whom the nomad's

flocks are easy game and farmers who defend their crops against grazing animals as vigorously as the shepherd his flock against beasts of prey. But in this border warfare the superior mobility and closer discipline and co-operation of the pastorals, and consequently their greater ability to concentrate for attack as well as for mutual defence, gives the intruders decisive advantage. Defeated at one point, they can retire into open country where the woodsman cannot pursue; victorious, they add the surviving inhabitants to their establishment and domesticate—that is to say, enslave—them as 'hewers of wood and drawers of water,' and above all, as growers of those vegetable luxuries, 'the onions, the leeks and the cucumbers,' which almost reconciled the pastoral Israelites to sojourn in 'Egyptian bondage.'

The extent to which pastoral people in the course of this kind of migration are able to penetrate the parkland fringe of a

forest belt obviously varies, and is determined by local circumstances, examples of which we shall have to consider. As long as intrusion is marginal, and the way remains open for withdrawal on to the grassland whence the intruders came—as has happened on many occasions—the results are more significant to the conquered than to the invaders, though the latter can hardly escape some degree of transformation in habits of life and outlook. Two other cases, however, are of more profound importance: in which, namely, the intruders either become permanently and irrevocably involved in their new surroundings, and habituated to them; or else make their way clean through the woodland and emerge into open country more or less like that from which they started.

Examples of the first alternative are the numerous immigrations of originally pastoral peoples from the Eurasian steppe into the forested European peninsula, beyond which lies nothing but the Atlantic coast-line, or from the margin of the Arabian desert into the 'good land this side Jordan' which fronts on to the Mediterranean; of the second, the coming of the Magyars into the Hungarian plain through the Moravian Gate and the passes of the Carpathian range, the coming of the Turks into Asia Minor, and (on a far more momentous scale) the coming of the Aryan-speaking peoples from the Eurasian steppe into the Persian plateau and Mesopotamia, and into northern India.

It hardly needs to be said that such an avenue, once disclosed, through the whole breadth of an uncongenial or obstructed region into a 'good land' beyond it, does not easily pass out of use; and we shall see how such habitual routes of migration have been among the most significant features of the Earth's surface, from the historical point of view.

Accordingly the fate of any folk who have traversed such an avenue, whether as the first pioneers or afterwards, is complicated by the subsequent arrival of other peoples along the same track, competent to displace and disorganize

them as they had disturbed whatever inhabitants they found already there; with the result, as Teggart has pointed out in his essay on the Processes of History, that the place of origin of a new type of civilization has usually been at the farther end of one of these great avenues. Conspicuous examples were the first historic cultures of Egypt, India and China; and the course of events on the land-bridge between North and South America has probably been essentially similar.

For it is in regions of stress and collision of this kind, and on occasions of such transmigration into unfamiliar surroundings, that the close tribal organization and intimately communal behaviour of simple societies, within which the individual counts for almost as little as the individual ant or bee, or the bison or horse in a natural herd of its own kind, undergoes such dislocation that the men who compose it have literally to 'think for themselves' because they may at any moment have to fend for themselves, irrespective of the customs or the needs of the rest. As Teggart expresses it,

the cardinal point is that the conflict, by breaking up the older organization, liberated the individual man, if only for a moment, from the dominance of the group, its

observances, its formulae, its ideas. Briefly, a situation was created in which the old rites and ceremonies could not be performed, one in which the old rules of action were manifestly inadequate, and hence one in which the individual became, in some measure, a law unto himself. This, at bottom, is the fact upon which all history turns.

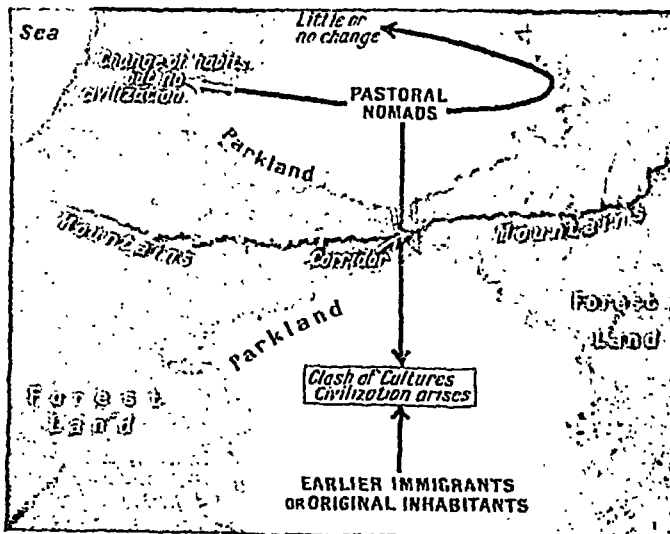
Familiar examples of such crises of disorganization, of the emergence of whole generations of intensely individualised, keenly self-conscious personalities, and of the origination of new modes of life and thought

Periods of Individual initiative

the periods celebrated in the Homeric poems of early Greece, in the epic literature of the Teutonic migration period, in the sagas of the Viking colonisation of Iceland, as they are interpreted for instance in Gilbert Murray's *Rise of the Greek Epic* and Chadwick's *Heroic Age*. The attempt, on the other hand, to conserve the 'custom of the elders' among an immigrant folk, in face of the temptation to 'learn the works' of the previous occupants of the country, and become acclimatised as they had been, is the tragedy of the Chosen People in the Promised Land of Palestine. And we shall see that, with this clue to their meaning, the earlier literatures of Baby-

lonia, Persia and India become an eloquent autobiography of similar experiences in those lands, which were equally regions of immigration.

In all such periods of crisis, of dissolution of old habits and social restrictions, and of transformation by individual initiative from obsolete to extemporised and original modes of life, there are involved obviously three principal factors: the geographical conditions of the region, the inherited qualities and initial behaviour of the new-comers, and the breed and civilization of any indigenous people who survive conquest. Each of these has been different in every cradle of new culture; and the result of their interaction



WHAT MAY HAPPEN TO PASTORAL NOMADS

Somewhere behind every outbreak of civilization one may suspect the irruption of comparatively nomadic folk into a settled area of different culture. This is a purely schematic exposition of the three fates that may befall the inhabitants of a grassland region who have started on their wanderings.

has also been different, though in some respects more closely analogous than might have been expected. What we have now, therefore, to do is to survey in turn the principal avenues of human movement, and describe the results of the clash of cultures at each of them.

Of the areas which we shall discuss, China and India yield few datable historical events that can be referred to the early period covered by the preceding

Chronicle. If, therefore, we place China and India first in our survey, our excuse must be that we are adopting the sound method of arguing from the simple to the complex; for in these two regions the circumstances surrounding the clash of cultures may be observed with some exactitude, whereas in Mesopotamia, Egypt and the Aegean we can only detect a similar chain of events by comparing analogous incidents.

How Civilization Dawned in China

THE great grasslands of the Old World are, or more strictly have recently been, five: Mongolia, the Tibetan plateau, the Eurasian steppe, Arabia and North Africa (see map in page 436). Each has long been a reservoir of a separate kind of pastoral folk, and the peculiarities of each of these breeds and their respective cultures are sufficiently well marked to justify the belief that each was long isolated by natural barriers of structure or vegetation, and that it was only rather recently that the principal avenues of egress from them were disclosed.

The Mongolian region occupies the northern and less elevated half of the lofty continental core of Asia. Including its two western prolongations into Zungaria and the Tarim Basin, it is about as large as Europe. Though the greater part of it is now desert, it is certain, from the distribution of ancient sites and lake-shores upon it, that formerly its surface was better watered and consequently its mountain rim more densely forested than now. It has three groups of exits, to the west, to the north and to the east, each into a quite different neighbourhood.

Westward the long corridor of Zungaria, still partially fertile, and the more rugged and abrupt passes north and south of the Alai Tagh, from eastern Turkistan to western, all open on to eastern sections of the Eurasian steppe. From our present knowledge of the early occupants of this second grassland we are justified in inferring that these western gates were closed by forest until early historic times, and that when they were first open they served rather to admit immigrants from Eurasia than to let loose Mongolian peoples into

the western world, as was their principal function later; inaugurating thereby a fresh chapter of history.

Northward, the numerous headwaters of the Yenesei and Amur—and, between these, of the Lena far to the north-east—intersect a broad belt of mountainous woodland, wherein emigrants from the Mongolian grasslands inevitably lost their primitive pastoralism and accommodated themselves to the forest life of hunters. Some of them, indeed, have exchanged their flocks and herds more or less completely for the local reindeer; others have not even this link with the past. Yet their physique remains

Mongolian in general, and there is little reason to believe that they found much alien blood here to mingle with their own. Only south of the Amur, in the coast islands Sakhalien and Hokkaido, are there remnants, such as the Ainu folk, of non-Mongol and presumably pre-Mongol inhabitants; but the greater part of the lowland of Manchuria, and even much of Korea, is in essentially Mongol occupation.

South of the Khingan Mountains, which separate eastern Mongolia from Manchuria, begins a third, or eastern group of gateways. Their extent is easily recognizable by the course of the Great Wall of China, Man's futile attempt to block them. Here violent west winds, and that inexhaustible supply of fine dust which they have brought off the surface of Mongolia to form the thick 'loess' deposit smothering all this region, restrict the spread of forest and expose the lowlands of North China from Peking to the lower Yang-tse-

Gateways from
Mongolian plateau



CRADLE OF CHINA'S IMMEMORIAL CULTURE

Reference to the map in page 346 will suggest the historic three-fold division of China here indicated. North China is a region of fertile loess, blown from the plains of Mongolia; Central China (the basin of the Yang-tse-Kiang), of alluvium; South China, of forest now reclaimed by colonists from the other two.

Kiang to repeated incursions of Mongolian hordes, made mobile by their possession of horse and camel, as well as other domesticated animals.

The principal drainage systems of south-eastern Mongolia itself have been 'captured,' as geographers say, by a northern tributary of the Wei-ho, and form now an immense horse-shoe-shaped valley, the 'Yellow River,' which gives its Chinese name, Hwang-ho, to the whole lower course of the Wei, as the Thame tributary does to the Thames. But the upper Wei short-circuits this large valley for most of Man's purposes, and has become the directest and easiest route between Mongolia and the coast districts. The loess-lands, moreover, as their height diminishes, become better watered and more fertile; and here, a little above and below the junction of Wei and Hwang-ho, stand the cities of Singan (Sian) and Lo-yang, long the alternate capitals of early dynasties.

The lowland of North China, widening eastwards from this point as far north as

the foothills of Khingan and southwards to the long Hwai-ling ridge which separates it from Central China and the lower Yang-tse, consists mainly of the delta of the well named Yellow River which has silted all the shallow, loess-obstructed sea, alternately north and south of what was once the island of Shantung, till more than half of the length of that hill district is now within the shore-line. Some districts of this oriental Egypt are still lagoon and fen; much is liable to disastrous floods from the main river; but large areas are covered with deep loess, incapable of irrigation but of immense fertility. Unlike the Yang-tse valley, it is a land of wheat and millet, but widespread destruction of upland timber for fuel has in time made its rainfall uncertain.

Though native historians of China have attempted to compile local traditions of earlier events into a continuous chronicle, history opens in this region with the arrival of new conquerors, the Chou Dynasty, probably in the twelfth century B.C. Their leader, Wan Wang, appears first as a warden of the western marches against other raiders from the interior, then, with the help of these 'men of the west,' as the popular

liberator from oppressive Chinese overlords, the Chinese marches Yin Dynasty, and the organizer of a confederation of territorial duchies, responsible to himself as 'Son of Heaven' and high priest of the whole people. But this was not the beginning of the Chinese civilization; it was a political reform of a people and a state already civilized. Chinese writing, for example, is found on works of art attributed to the Yin dynasty (1766-1122 B.C.),

which the Chous overthrew, and its invention, together with that of boats, wheeled carts, silk weaving, composite wind instruments and a system of measures, is attributed by Chinese authors to an epoch about a thousand years earlier than the coming of the Yins. To the same period are assigned an early expansion far beyond the primary region round Singan, and also wars with barbarous Hun-yu folk on the Mongolian frontier, reputed ancestors of the Huns.

The Chou Dynasty lasted till about 250 B.C., but the great work of its founders was less permanent. The Son of Heaven himself was not always an able ruler, and in border wars of expansion against Tatars to the westward, or the Miao-tze aboriginals of the south, frontier provinces and their governors counted far more than their overlord in the Wei valley. What kept the rickety empire together was the deep-seated loyalty of the mass of the population :

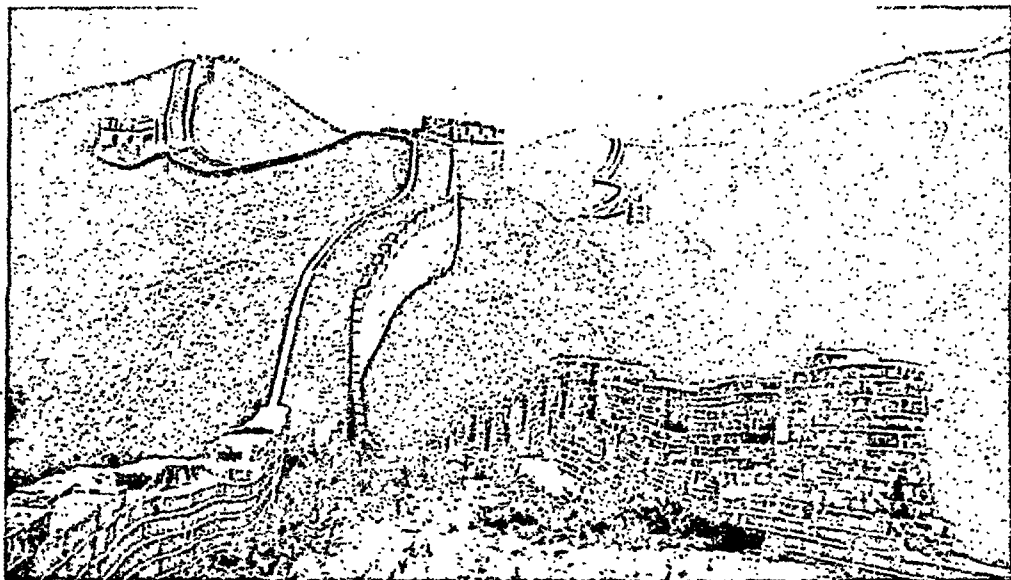
We nothing know or understand,
But to observe our lord's command,

as one of their early songs has it. And this loyalty, rooted in traditional observance—'we have to do as our ancestors

did: they obeyed, so we are loyal'—was reinforced also by the recurrent dangers of a common enemy, the Hiung-nu barbarians or the rival T'so state which grew up in the Yang-tse valley as the result of Chinese colonisation there.

Chief centres of disaffection were the western province of T'sin, which had been seriously Tatarised, like the home district of the Chous themselves long before; and the Ts'i Disaffection of
duchy in the maritime up- feudal duchies
lands of Shantung. These and similar feudatories in the seventh century temporarily superseded the imperial government by a confederacy of 'Five Leaders' holding chief authority in turn—or till they were divested of it. And the example thus set by great barons was followed by lesser men in the miserable period of the 'Contending States' which followed. The predatory self-seeking of the Tatar nomad was breaking out, indeed, in the midst of the neighbourly co-operation habitual among the Chinese farmers themselves.

The typical incidents of early Chinese history are frequently repeated. A local magnate, sometimes from a frontier pro-



LOOKING ALONG THE GREAT WALL, CHINA'S BARRIER AGAINST THE MONGOLS

Who the nomads were against whom North China had to guard itself is clearly shown by the course of the Great Wall (see map opposite). It was started by Shih Hwang Ti, who came to the throne in 221 B.C.; but just as it was not finished until many centuries later, so the need that prompted its construction goes back into the unrecorded past. This view shows it where it winds up the mountain side after crossing the Nankow Pass north-west of Peking.

vince and skilled in war, sometimes an able administrator nearer the centre, makes use of popular discontent with the central administration, seizes Loyang or if possible Singan, staves off an invasion of Hiung-nu from Mongolia, reconstitutes the feudal confederation of provinces north of the Yang-tse and occasionally extends his suzerainty south of it. After various intervals the dynasty so founded becomes demoralised, and gives place to a new rebel, defender and reformer; sometimes also throwing up a protest, such as that of Confucius (see Chap. 40), against moral as well as political abuses.

But meanwhile the life of the densely populated provinces goes on. Wheat and millet, supplemented locally by barley and other grains, and garden crops, are the basis of subsistence, adequate except in time of flood or drought to maintain close-

knit family communities, regulated within by the law of filial piety and adjusted to each other by that of consideration for others. Only when Tatar influence predominates, as it does under a weak overlord, is this morality contested by the raider's creed of 'each for himself'; in ordinary times it reduces local administration to the adjustment of a few hard cases and the relief of accidental distress, and makes centralised government superfluous except when the Hiung-nu are on the frontier or the Yellow River breaks bank.

But such a mode of existence, adequate and stable as it has always appeared to the Chinese themselves, barely scratches the surface of China, in exploitation of its natural resources, coal, iron and other minerals, its upland water power or its fertility for other crops than the traditional foodstuffs and pasture. Consequently when the sea, instead of an impassable no-man's-

land, came to be a highway for distant nations already industrialised and alert for markets, the traditional culture of North China found itself ill-equipped either to resist or to reform itself.

Down to this point attention has been confined to the region of North China, the basin of the Hwang-ho and its tributaries—loess-land or alluvium derived from it,



FIGURES FROM THE CHINESE BORDERLAND OF LEGEND AND HISTORY

Chinese history may be said to begin with the Chou Dynasty, fresh invaders who established their power in about 1122 B.C.; this bas-relief of the Han period (c. 100 B.C.) shows the youthful Ch'eng, third sovereign, under whose guardians the kingdom was consolidated. But Chinese historians speak of things far more remote; above we see three legendary kings, of whom Chu Yung (right, in combatant attitude) was a warrior, and Shen Nung with his plough the first husbandman.

From E. Chavannes, 'Sculpture sur Pierre Chinoise'

bearing wheat and millet rather than rice and exposed to immigration from the northern, Mongolian half of the Asiatic core. But this is only one half of the story. South of the Mongolian plateau lies the much loftier grassland region of Tibet, of about equal extent and triangular like Mongolia, with a westward avenue from Kashgar through Ferghana on to the Eurasian steppe beyond Tashkent and Samarkand, and with greater difficulty over the Pamirs to the upper valley of the Oxus.

Outwards from this dry plateau of Tibet, towards the monsoon-watered regions to south and east, pastoral folk have long been drifting lengthways along the upland grazing grounds, between the longitudinal valleys which are filled with dense forest and jungle. When those impassable valleys are continuous, such plateau folk can only move straight ahead, and they have therefore penetrated far through Indo-China and Malaya, evading appreciable commixture with older jungle-folk till the ridges themselves subside and the valleys widen, away to the south. The result is a mosaic of peoples and cultures in Upper Burma and Yun-nan, including even some pale-faced, fair-haired strains, thought to be strays from western regions. Immigrants and transmigrants are now, however, of uniformly South-Mongol descent and Tibetan origin.

But in the highlands overlooking Sze-chuen the main stream of the Yang-tse has barred this movement lengthways. When the uplands in due course become congested districts, their occupants are obliged to descend; and in the fertile red soil of Sze-chuen, so charged with moisture that it can be terraced and irrigated locally to the very hilltops, they have changed their mode of life and become



CHINA'S EARLIEST WRITING

Though history begins with the Chous, we possess relics from the Yin Dynasty which the former overthrew—such as this antler carved with a Yin inscription.

From the British Museum

settled cultivators of hill-side shrubs, aromatic or stimulant, for whose produce—oranges, rhubarb, opium and other drugs—there is immemorial and unlimited demand among the milk-fed pastorals of the regions behind them. Eventually, through similar exploitation of the lower basin, another hill-side shrub, the tea plant, attained paramount importance in this kind. For whereas in the West some of us flavour our tea with milk, on the plateau it is milk diet that is made palatable with tea.

A greater economic revolution came when settlement outwards and downwards from the high pastures reached the fens along the water courses, and either discovered rice for itself, or adopted it from jungle aborigines and improved its cultivation by regulating the water-courses and redistributing

their water among the paddy-fields.

On a far larger scale, but with the same tell-tale association of rice-fields on the alluvium, with tea plantations and other luxury crops such as ginger, orange and citron on the foothills, the lower basin of the Yang-tse with its tributaries became the regional provinces of Hu-peh, Hu-nan and Kiang-si; and in time the delta regions of Kiang-su were reclaimed in the same way. It is in Kiang-si that the vast deposit of china clay has supplemented the tea-and-rice culture with an article of daily use, the food bowl of porcelain superseding wooden vessels, which has made 'china' a household word for the finer sorts of earthenware.

South of the Mountains of the South, also, the great provinces of Kwangsi and Kwangtung (Canton) along the Si-kiang (West River) owe their culture and prosperity to men of the Yang-tse regime intruded gradually among the Miao-tse

aborigines, whose greater numbers in all districts south of the Yang-tse are proof of the profound significance of that cross-country barrier to the spread of peoples.

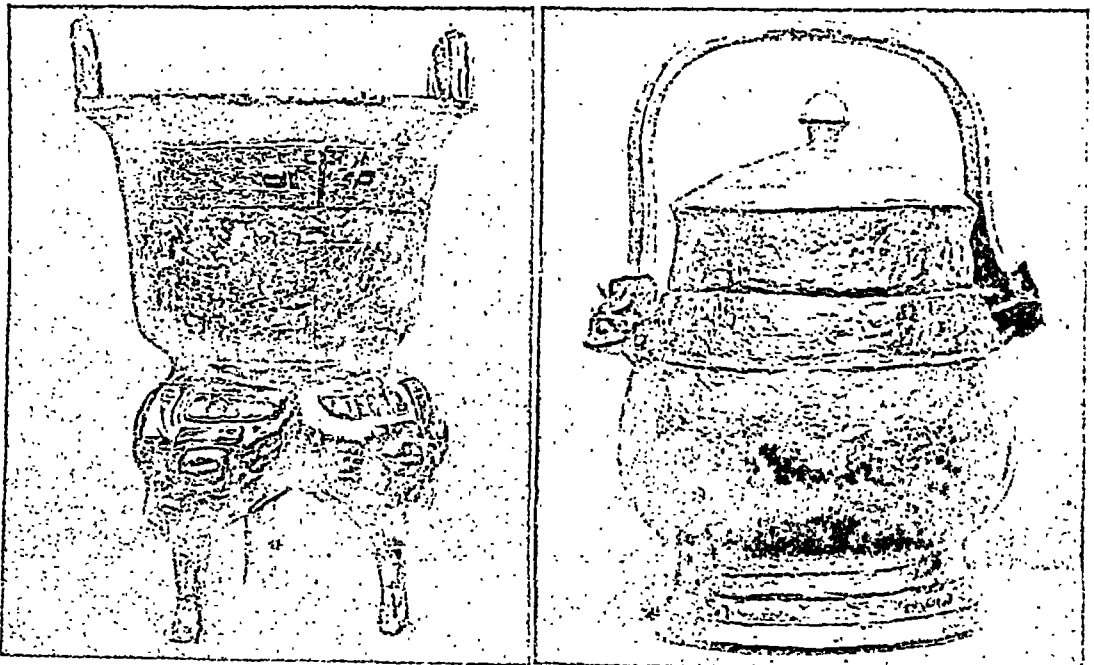
In this summary review of early Chinese conditions a few main facts are obvious, while on other points there is at present no trustworthy evidence. First, it is clearly to northern

Facts that emerge from Chinese history China, in the basin, that is, of the Wei-ho and Hwang-ho, that we have to look for the cradle of Chinese civilization in its historic maturity. As far back as our evidence goes a Chinese people is there, living much the same life as the peasantry and townsfolk of to-day. Always it has two chief preoccupations, to keep the rivers from overflowing their silt-loaded channels and to keep the nomad Mongols from overflowing through the valley heads. The second danger, it is true, has become negligible in recent times, because latterly much of the Mongolian plateau has become uninhabitable. But the danger from 'foreign devils' is no less. The railway through Siberia has opened a new pass from the west into

Manchuria; the progress of navigation has installed foreign settlements at Shanghai and even far up the Yang-tse valley at Hankau; and Peking, which can at once watch the roads out of Manchuria and the coasts of the Gulf of Chih-li, has replaced Singan and Loyang as the political and strategical capital.

The history of China is still, what it has always been, the history of the resistance of a 'Middle Kingdom' to aggression from without. Apart from this danger, and the long sequence of attempts to repel it, the Chinese are indeed in the enviable position of having no history. Only in the vaguest tradition have we glimpses of a China in which the rivers wandered unrestrained and there were no fields of wheat and millet, no mulberries or silk-worms, no wheeled carts, no Minister of Education or of Music in the cabinet.

But how long has this state of things been in existence, and how did it originate? Seeing that Chinese wheat and barley are varieties of the same plants as the ancient wheats and barleys of the Near East, and that these have been found wild there but



BRONZE-WORK CAST IN THE TIME OF THE YIN DYNASTY

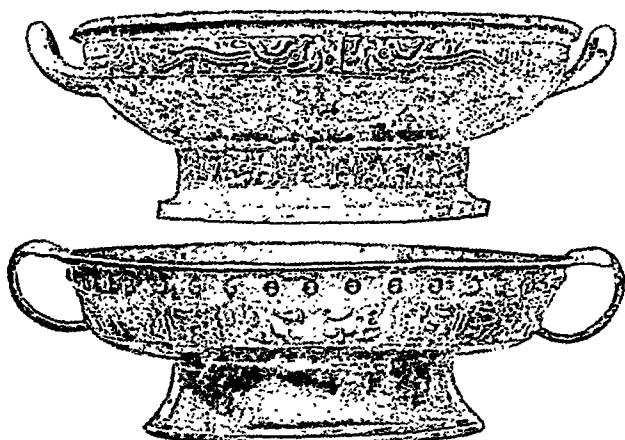
Most relics from the age of the Yins are bronzes, and their finish argues an already mature civilization. Left is a vessel for steaming sacrificial herbs; the base is hollow and separated from the upper portion by a colander, so that when placed over a fire steam from the water below may penetrate to the herbs above. Right, a libation jar with an inscription underneath the handle.

From the Victoria and Albert Museum, South Kensington

not in Eastern Asia, it is a tempting speculation that the use of these crops spread gradually eastward at a period when the climate of the vast intervening regions permitted it, and that the first agricultural occupants of northern China arrived by the same routes as their subsequent invaders, and from the same immediate homes.

But the physique of the modern people varies locally. Discounting as comparatively recent the Tatar and Manchu admixtures, there are survivals of a different breed in the woodlands of Shantung; even on the northern limits of the Yang-tse basin there are records of conflict between Chinese colonists and Miao-tse aboriginals; while southward and in Sze-chuen the quite recent spread of the full-blooded Chinese people and its culture becomes demonstrable. For the rice-and-tea-growing culture of central and southern China a different origin must be sought, however overlaid with customs from the north it may have become in historic times.

In these regions, too, as has been hinted already, expansion seems to have been down-stream from the west, and much of the flood-plain of the Yang-tse is probably of more recent origin than the people who have occupied it as it spread seawards. But it is a question which cannot yet be answered whether this southern subtropical culture had the start of the northern, and had spread north-



FROM THE TWILIGHT OF CHINA'S HISTORY

In the historical age of the Chous a greater perfection of technique appears in the bronzes; witness these two great sacrificial bowls. The lower, 33 inches across and inlaid with gold and silver, bears a long inscription on the inside, while the embossed band represents the ogre T'ao T'ieh.

From British and V. and A. Museum

wards beyond the Yang-tse basin before it was repelled by the surplus population of the wheat-growers.

In the south that intense industry, neighbourly courtesy and absence of individual initiative, which are fundamental in Chinese culture, are maturer even than in the north, and seem to be more at home in their surroundings both natural and economic. But it must be remembered that the geographical control exercised by the loess soils of the north has at all times restricted the southern types of agriculture, so that a different regime is imposed on each of the great river basins, and primeval colonisation from the south was exposed to transformation quite as far-reaching as the Chinese settlements in the south itself.

India and its Aryan Invaders

ONE of the contrasts between the history of China and that of India results from the differences in the method of inquiry. Both the indigenous culture of China and the civilization of its invaders are in most respects isolated facts; comparison is only possible with kindred peoples in very much later periods, such as the aborigines of Yun-nan, described by modern travellers, and the medieval Tatars. The aborigines of India simi-

larly have their modern counterpart only in the jungle-folk and other survivors in secluded districts. But the Aryan-speaking invaders had beliefs, institutions and a mode of life that can be recognized in other regions through the fact that their speech belongs to a widely distributed family of languages, possessing in common many words for natural objects, instruments of daily use, practices and ideas underlying them.

From the study of these it has been possible not only to reconstruct in outline the mode of life which was once enjoyed by the ancestors of all these peoples under similar geographical conditions, but even to detect, by comparison of the divergent vocabularies of the derivative languages of later times, the subsequent experiences of each group of Aryan-speaking folk, in the course of their movements through regions of other physique into the countries where those derivative languages were spoken and may be studied in their literatures or in everyday speech. By this method of comparative philology, therefore, discovery passes far beyond the periods represented by the earliest extant documents, and tests popular traditions by the forms of the very words in which they have been preserved.

✓ It may be accepted, for example, as certain, that all Aryan-speaking peoples,

whatever their racial

Tribal Organization origins, have received
of the Aryans their language and

large elements of their

culture from tribally organized folk, originally of nomad-pastoral habits, occupying once a wide grassland region remote from the sea. They were in possession of the horse, as well as oxen, sheep and goats, and consequently were well equipped for hunting and for aggression, as well as for the care of flocks and herds. From their possession of a primitive vocabulary for the simpler processes of cereal agriculture, and also for certain forest trees, it is inferred that they ranged widely into the parkland which bordered their grassland cradle, and utilised its resources of timber for dwellings and also for wheeled carts.

The latter gave them ampler facilities, not only for transporting their families, but for conserving and elaborating numerous domestic arts which the women of merely horse-riding nomads have to forgo by reason of the difficulties of transporting household gear. For the same reason it was possible to penetrate farther than such nomads usually can into forest country, without disorganizing the close-knit structure of their tribes and families. It is this great invention of a home upon wheels—of the wheel itself the origin is still quite obscure—

that has made possible, for example, the intrusion of gipsy communities into the midst of modern nations. And there is some reason for believing that the knowledge of wheeled vehicles among Aryan-speaking folk did not long precede their dispersal into the new regions which this instrument of transport opened to them.

From this exploration further effects followed. On open grassland there is good going in all directions, at any season when men wish to move about at all. But in parkland and forest, especially in rolling or hill country, such travelling is restricted to routes of least difficulty. Such roads have in the first instance to be cleared; then traffic itself defines and consolidates them, but also necessitates repairs; streams, too, must be crossed by paved fords, or (where timber is available) by bridges, and these also were provided very early. The great rivers of the grassland itself gave occasion similarly for ferries, as well as for stream-wise voyages.

Little wonder that the notion of a Way beset with various difficulties, leading to an objective only dimly conceived and depending at every step on decisions and choices which only knowledge could rightly guide, became the

symbol of moral pro- The 'Way' a symbol
gress and guidance of moral progress
among these people,

as their tribal behaviour ever encountered new problems of conduct during their actual journeys. What the 'sojourn in the wilderness' was for the early Israelites, the Way through mountain and forest became for these Aryan wanderers.

Primitive words and phrases for parkland life and observances, in respect of tree cutting and road making, reveal early Aryan-speaking folk as careful foresters as well as pastorals and cultivators. Like the less equipped emigrants from the Tibetan highland into south-eastern Asia—and, even more conspicuously, from the necessary aversion of carriage folk for boggy country—they travelled high, used hill-tops as landmarks and holy places, regarded water-courses rather than ridges as their natural boundaries, and had special regard for certain upland and parkland trees, oak in the deciduous forests of the European peninsula, pine,

cypress and cedar on the loftier ridges between the Eurasian steppe and their eventual homes in Persia and northern India. The deodar of the Himalayan forests is literally 'the tree of the gods.'

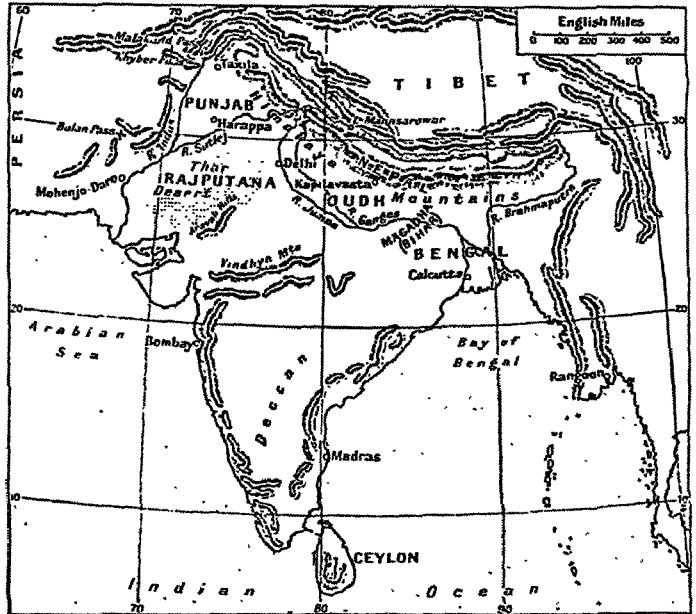
In such conditions, while the denser forest and jungle of the valleys was the haunt of foes and of fears more potent still, the peaks, the sky, the winds and clouds, the dawn and the sunlight, were beings congenial and beneficent. No less powerful and kindly, though capable of dire devastation, was fire, the forester's first aid, which skill and luck combined to elicit by rubbing one piece of wood upon another till friction engendered flame.

This creative act, so amazing, so essential, so responsible, became a central mystery and a symbol of social coherence; men 'of the same fire' were bound by a tie as indissoluble as is due to those totemic animals and plants which designate human relationships in many primitive communities, especially among hunting peoples. For the creation of fire by these methods scrupulous cleanliness is essential; moisture, grease, dust and soil are equally fatal to achievement; and no less was such purity necessary for dairy work, the preparation of animal food, the simple carpentry and other home industries of these highland tribes. And on the rain-washed highlands cleanliness was attainable, while in the jungle it was not.

Experience of jungle-folk confirmed this, and perhaps offered a too obvious explanation for the darker and darker complexions encountered by those people of Aryan traditions who wandered farthest south. Moreover, there seems little reason to doubt that these migratory pastorals from the Eurasian grassland were themselves predominantly if not typically blonde.

Whatever the motive may have been—tribal exclusiveness, cleanly habits or mere colour-bar as it is now the fashion to call it—the Aryan civilization inculcated an exclusive race consciousness which was an important factor in the maintenance of its observances amid diverse and unpropitious surroundings.

With the fortunes of those Aryan-speaking tribes who spread westward, north of the Caspian Sea, and even of those who found their way on to the margins of the



THE HERITAGE OF THE EASTERN ARYANS

The invaders who gave the impetus to India's civilization were not Tatars from the Mongolian plateau, as in China, but Aryans from the Eurasian steppe. Their first settlements were in open parkland, like that which they had left, round the upper waters of the Indus.

great Persian plateau and beyond it into northern Mesopotamia, we are only concerned here in so far as they offer comparisons with the Aryan immigrants into India. These, in their transit through the mountain zone, necessarily experienced far more intensely than others the discipline of the highland forests, and descended more compactly organized, and dominated by notions more precise and austere, into a region more profoundly uncongenial than the destination of any other such adventurers.

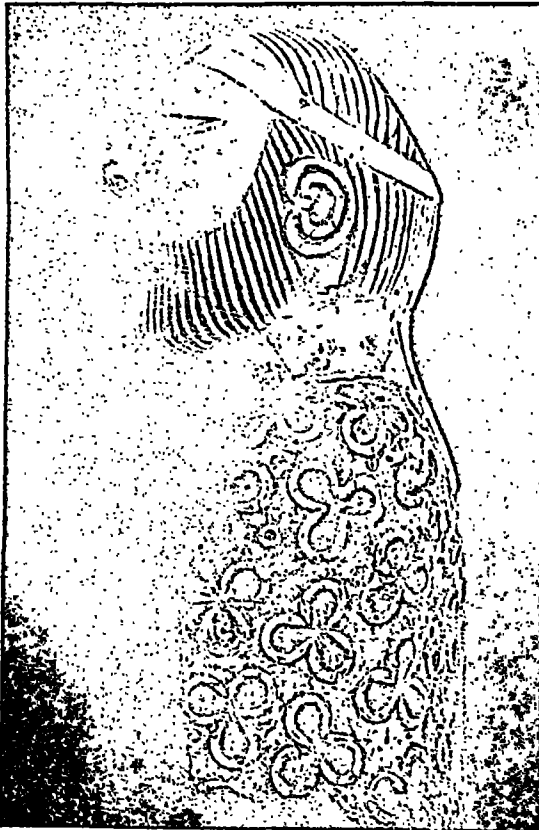
Of their actual transit it is unlikely that material evidence will ever be recovered. The wooden instruments and

constructions of a woodland people perish easily, and the very low status of the potter in all Indian communities indicates that his art was not among those practised by his conquerors. The practice of cremation, too, has deprived us of the priceless information which tomb furniture supplies among peoples who are sedentary and bury their dead. Only the reverent accuracy with which the songs, the traditions, the wisdom and morality of bygone times were treasured in these exclusive and stable societies has preserved in outline their mode of life and the story of their doings.

From the moment, however, of their descent into the foothills and upper plains, and their establishment of permanent centres of administration maintained and adorned by the labour and craftsmanship of their native subjects, archaeological testimony is possible, and this is now

slowly being discovered. Pre-Aryan India was by no means all jungle and barbarism; the north seems to have had intermittent communication—commercial, at all events—with the Sumerian culture of the Euphrates-Tigris delta. In the south a large area in the Deccan plateau practised iron-working, made fine pottery and built tombs with large slabs of stone, earlier than there is any reason to believe that Aryan culture penetrated thither; nor were any of these arts within the Aryan ken. The coming of the Aryans was, then, a real clash of cultures, with all that such a tragedy implies; and Indian history is the sequel to this crisis.

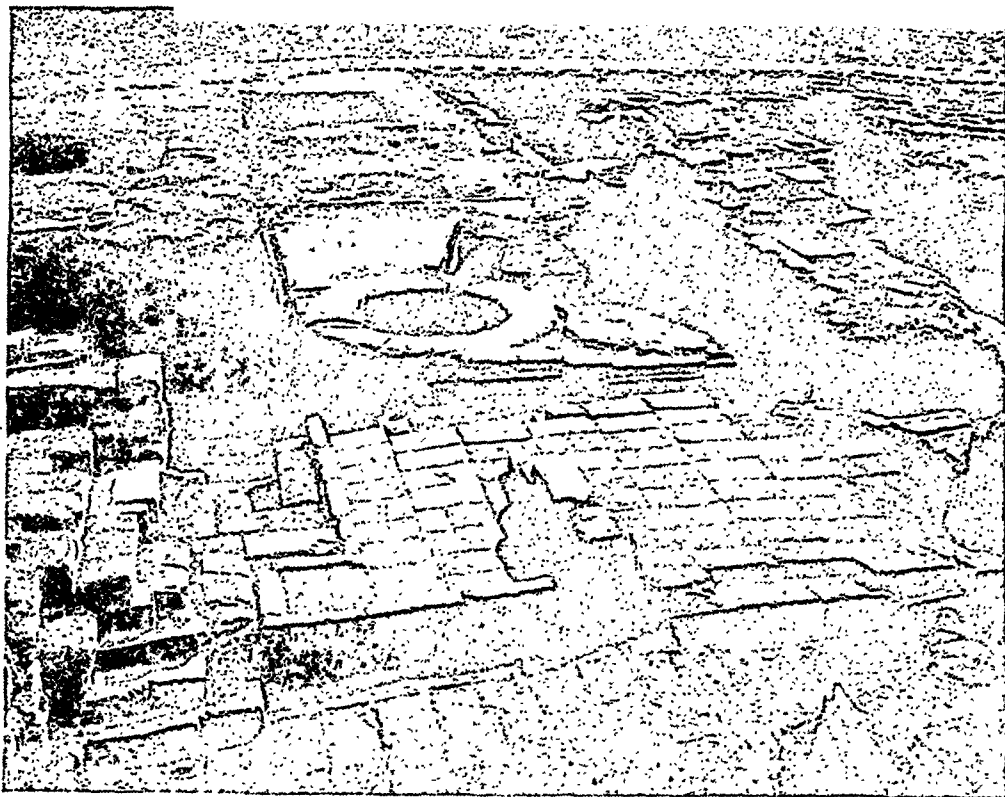
The Aryans' view of the regions into which they had come is symbolised by their traditional description of the Lotus of the World, with its seed-vessel in the sacred lake Manasarowar, mystic reservoir



EVIDENCE FOR CULTURAL CONTACT BETWEEN INDIA AND BABYLONIA

Mohenjo-Daro and Harappa are the two Indo-Sumerian sites hitherto excavated. From the former came the splendid limestone statue, decorated with white plaster and red ochre; from the latter the bull-seals and the example of pictographic script (undeciphered), both of which are said to exhibit Sumerian relationships. The pot painted with fishes is from Nal in Baluchistan, which yields finer pottery than the city sites; it provides a westward link with the painted ware of Elam.

Courtesy of Sir John Marshall, Director General of Archaeology in India



BATHROOM OF A PRIVATE HOUSE IN PRE-ARYAN INDIA

India as the Aryans found it was not entirely savage. A restricted area in the north-west had given rise to a complex culture, probably through intercourse with Babylonia ; and these Indo-Sumerians, as we may call them without alleging any community of race, had a high regard for the material comforts of life. All the streets in Mohenjo-Daro, and even the houses, were drained with fine brick runnels, while the latter, as seen here, had their private wells and paved bath-rooms.

Courtesy of Sir John Marshall, Director General of Archaeology in India

of life and source of the Sutlej river, with Indus and Brahmaputra rising near by, much as the Rhine, Rhône, Danube and Ticino have adjacent sources in the heart of the Alps ; its inner petals, up-turned, form the Himalayan ranges, and its outer row, reverted, are the sections of foothill and plain between the greater rivers, tapering to their junctions with the main channels of Indus and Ganges. Of the northern half of the Lotus little was known, and much had evidently been forgotten.

The main ways of descent from the highlands were probably through the western passes, Bolan, Khyber, Malakand, into the Punjab, though some early descriptions have been identified with mid-Himalayan routes. The Aryavartas, or districts of Aryan-speaking settlement, which resulted lay in two groups, an earlier

one among the Five Rivers tributary to the Indus, another rather later among the Himalayan tributaries of the Ganges. Between these two groups, as their territories expanded, there was heroic warfare, commemorated in the Mahabharata epic.

Naturally the strategical and commercial advantages of a site at the confluence of each pair of frontier rivers determined the position of the capital of each region ; behind this lay the corn-land and cattle-ranches, and above that the hills with their timber, minerals and holy lakes and springs. Across the Jumna and Sutlej lay a great region too dry for Aryan exploitation ; beyond this again another world with hill country and forests of its own, along the Aravali and Vindhya ranges, inhabited by men of darker colour and alien speech and habits.



GRAVE OF A PREHISTORIC INDIAN

No more than the north-west was southern India without its indigenous culture before the Aryans arrived. For instance, there are the cist-graves of Hyderabad, of which this is one dug out and opened, revealing pottery and human remains

Courtesy of E. H. Hunt and Royal Anthropological Institute

Eastward, too, Aryan expansion was checked by collision with a quite different set of intruders through east Himalayan passes, Mongoloid exploiters of the Brahmaputra and lower Ganges, akin to those whom we have seen descending through Sze-chuen into the Yang-tse valley.

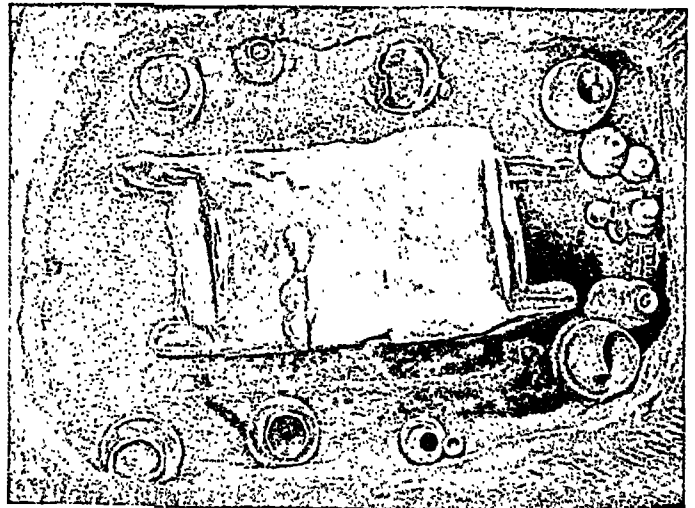
It seems probable that Aryan immigration into India may have begun about 2500 B.C. It was, however, a long process, for even in hymns of the Rig-Veda, which may date from about 1200 B.C., Aryan territories were still limited southward by the physical barriers of Rajputana and eastward by the upper Ganges; and there is some reason to believe that the descendants of the first immigrants were divided by a later direct invasion of the midland country between Punjab and the Jumna, and driven outwards to east, west and south: mere tribal wanderings giving place now to colonisation of a more organized sort.

✓ Of the former occupants of the country it is difficult to form a clear notion. The Aryan conquerors called them Dasyu, and early poems described them as black-skinned, flat-nosed, unclean people

'who do not perform sacrifices, nor believe anything,' but inherited from their mothers and were ruled by them. But, in the same texts, they have fortresses of stone, governed by powerful kings of great wealth and magical skill.

Physically they may be identified with the Dravidian type, widespread in modern India, and the presence of Dravidian words even in Vedic texts, and more commonly in classical Sanskrit, confirms this. In time, too, snake worship, demon worship and other religious and magical practices, alien to Aryan tradition and belief, were tolerated in Aryan communities. But the older population was itself already composite, and the Dravidian culture, like that of the Mongol intruders in the north-east, represents probably the effects of some previous immigration on aborigines earlier still, such as the Nishada folk whom Purana documents describe as black, low-statured, with high cheekbones, red eyes and copper-coloured hair.

Even in the later Rig-Veda, the first exclusiveness of Aryan society was being mitigated by treaties and alliances with Dasyu states. Intermarriage began, and there was danger that the conquerors, always comparatively few, might be assimilated in their indigenous subjects. The only practicable remedy was to recognize



HALF-TON SLABS OF A HYDERABAD CIST

Excavation of an Indian cist reveals what is virtually a box of stone with floor-slab, end-slabs, side-slabs projecting beyond the latter, and a roof-slab holding the whole (perhaps 11 feet long) together, as this downward view well shows. Round it is some of the pottery, well shaped and carefully polished.

Courtesy of E. H. Hunt and Royal Anthropological Institute

the conquered as an additional and inferior class within the Aryan communities, which already distinguished, in dignity and social status, between Brahmins (priests), Kshatriyas (fighting-men who were also the governing body) and Vaisyas (cultivators and artisans). Below these, accordingly, stood the Sudras or slaves, and below these again, eventually, the outcast Nishadas of hill and forest.

In the midland region the priestly Brahmins, by way of further precaution, drew more strictly the distinction between themselves and even their Kshatriya rulers. Elsewhere, and especially in the remoter regions of colonisation and conquest, intermediate ranks tended gradu-

ally to disappear, leaving the single barrier between Brahmins and Sudras; while everywhere local (and especially economic) distinctions subdivided all inferior ranks into innumerable 'castes,' each with its special functions in the community, its disabilities strictly enforced by those above it and its privileges as jealously guarded against those below. The Brahmin monopoly of religious and eventually of social prestige led inevitably to abuses, and these in turn to protests and revolts, such as that of the Buddha, comparable to that of Confucius in China already noted. The history of this revolt, and the subsequent vicissitudes of India's composite civilization, are elaborated in Chapter 40.

The Nascent Communities of Babylonia

WE turn now to a third region of ancient civilization, more familiar than either India or China, because its gifts to mankind have been both earlier and more direct, and also because both its antiquity and its significance have been appreciated far longer among historians. It is, however, only quite recently that the origins of Babylonian culture have been disclosed even in outline, as the result of scientific dissection of those great mounds of ruinous brickwork which mark its city sites, and decipherment of the documents which they have yielded so copiously because the material on which they were inscribed is almost imperishable.

Thus, whereas in China the early sites are still unexcavated and in all India only two have been explored as yet, while the

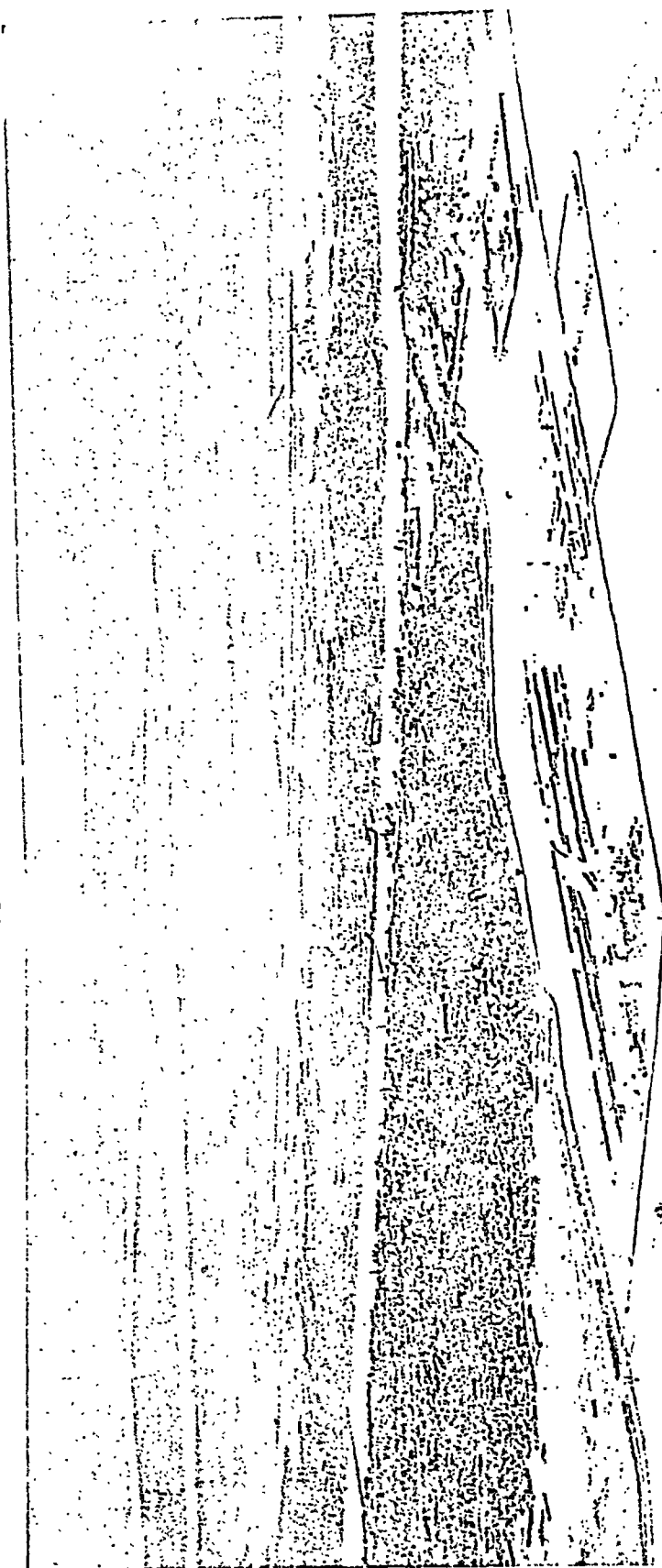
literatures of both countries are preserved Great wealth of
Babylonian records only in late editions
and still later manuscripts of these, Babylonian history comes to us from nearly a score of early sites and many thousands of original documents representing every phase in its development. Among this wealth of evidence it is only possible to select here those points on which agreement among scholars is completest, and analogies or contrasts with the course of events in India and China are most instructive.

The south-western margin of the great Persian plateau is a broad belt of parallel

mountain chains, which rise as abruptly above the lowland in front of them as does the Himalayan range above the plains of the Punjab and the Ganges valley. Behind—that is to say, north of—these great ranges lie the two plateau regions of Persia and Asia Minor, separated by the wildly confused highlands around Mount Ararat, but both of them connected by fairly practicable avenues with the extreme ends of the great northern grassland: the Persian plateau through a broad gap in its own north rim, west of the end spurs of the Hindu Kush, and Asia Minor by way of the Marmora region, the Balkan passes and the Danube valley.

Between these extreme points almost continuous obstacles—the North Persian mountain zone, the Caspian Sea, the steep hog's-back of the Caucasus, and the Black Sea—preclude access from the grassland except by narrow and difficult postern gates through or past the Caucasus; and even these have the inner guard of the Armenian highlands in rear of them. All attempts on the part of the men of the northern grassland to gain access to regions south of this great mountain zone were beset with grave difficulties, and in particular were throttled down, so to speak, in passing through these two plateaux within the mountain zone itself.

On the other hand, in front (to the south) of the mountain zone lay another great flat-land, desert at its heart but grassy or



CHARACTERISTIC AREA OF THE GREAT ALLUVIAL PLAIN OF MESOPOTAMIA SEEN FROM THE AIR

Formed of the alluvium deposited by the Tigris and the Euphrates, Mesopotamia is consistently flat, the level of the land under normal conditions being very little higher than that of the rivers; above is a typical area watered by the Tigris, which is here seen in flood, at Bagdad. The soil is therefore liable at some seasons to become water-logged, while at others it is parched and baked; but it can be made extraordinarily fertile by drainage and irrigation. The staple foodstuff has from time immemorial been the date, but the country can produce three crops of wheat a year.

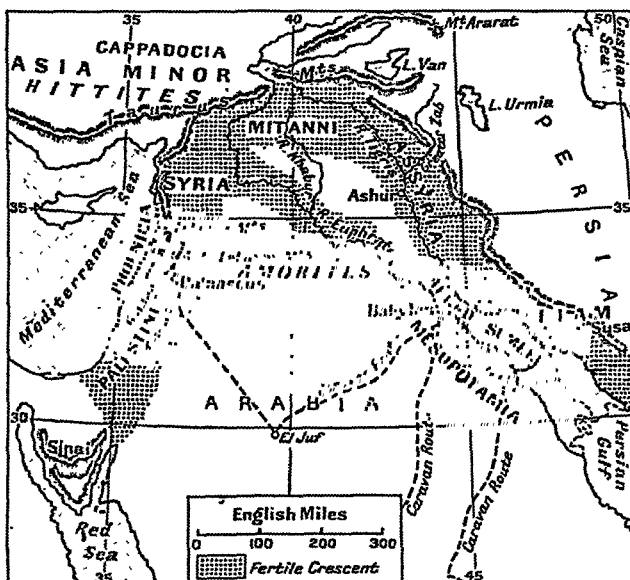
Photo. Royal Air Force Official (Crown copyright)

cultivable nearer the foothills: the Arabian peninsula. It is a peninsula by the curious geographical accident that, in the formation of the mountain chains just described, pressure upon the easternmost section of what was then a continuous African continent snapped off, as it were, one vast slab and tilted it slightly towards the bulging front of the new mountains. Most of the line of fracture, flooded now by the Indian Ocean, forms the Red Sea and, farther north, the straight sea-coast of Palestine and Phoenicia; the tilted slab itself is Arabia, with its western edge upraised to form the mountains of Lebanon, Sinai and the Red Sea coast; while its south-eastern surface dips water-logged into the Persian Gulf like an ill-laid flagstone in a pavement.

Naturally the original drainage of this Arabian slab was eastward into the trough following the base of the Persian mountain-range which the Tigris still occupies; the Euphrates still follows such a course, and there are other great channels, now waterless, across the surface of central Arabia. The reason why Euphrates and Tigris have persisted when these other streams ran dry is that their head streams have captured the copious snow drainage of the Armenian highland; and the Tigris has an ampler flow than the Euphrates, because in addition it receives (like the Indus and Ganges) several large streams out of the snow-capped and rain-swept highlands hard above its eastern bank.

Other such streams from the east still empty themselves directly into the Persian Gulf, forming broad deltas; and the reason why the Tigris has as long a lower valley as it has, is that similar lateral deltas, uniting successively with its own, have filled up some five hundred miles of the original gulf and are advancing the present shore-line at the rate of about a mile in a generation. When this silting process began the Euphrates had its own

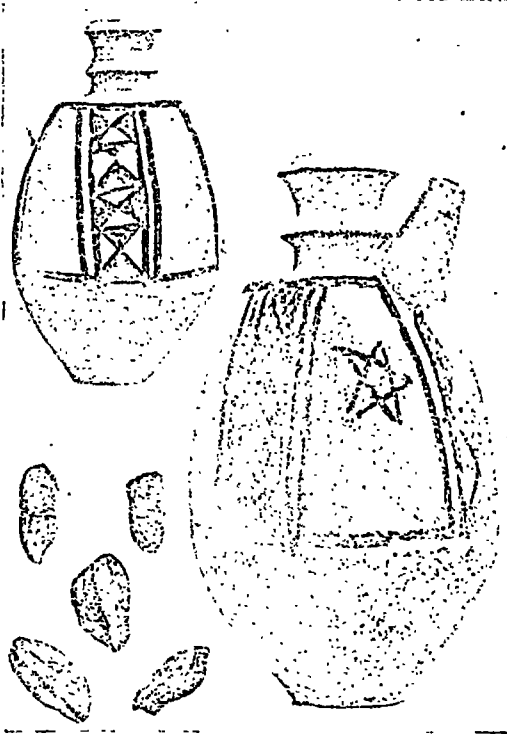
mouth and delta on the west side of the gulf; but long ago this delta joined that of the Tigris, and the two main streams, first converging till they are within 35 miles, then dividing into several channels and interchanging their surplus waters, have created Babylonia, a vast alluvial region over 100 miles wide, desert or grassland at its upper end, more and more swampy below, but in great part irrigable without much difficulty, and amazingly fertile. Intelligently cultivated, it bears, for example, three crops of wheat in a year.



SEAT OF AN ANCIENT CIVILIZATION

If Egypt owes its fertility to the Nile, the very land of Babylonia is the gift of its two rivers. At the dawn of the historic period the waters of the Persian Gulf extended nearly 180 miles inland from their present limit; and 6,500 years earlier still there was no delta land 'of Sumer and Akkad' at all.

In particular, along the water-courses the date palm grows untended; and its fruit offers a complete diet for Man and beast, a very 'tree of life in the midst of the garden.' Whether the vine, which has spread down-stream from the neighbouring highlands, has a similar title to be called a 'tree of knowledge' is a question less easily answered; but a region so simply and adequately endowed with the necessities of existence, and supplied with numerous and inexhaustible streams, was a paradise which could hardly escape the notice of its neighbours, from the moment, not so very long ago in the



EVIDENCE OF EARLY AGRICULTURE

A painted jar of early Sumerian workmanship, dated to about 3500 B.C., was found to contain grains of wheat which some experts assign to a fine and highly developed species, *Triticum compactum*. If so, Sumeria was ahead of Egypt, with its contemporary spelt wheats.

Courtesy of Professor Langdon

vista of the past, when it began to come into existence. If we could be sure that the rate of alluviation had always been what it is now, we might reckon the starting point as about 12,000 years ago; while if that rate has been increasing, as seems likely, the period must be correspondingly greater.

What kinds of men were in a position to take advantage of these exceptional natural resources we may infer from the surroundings of the region. On the east the foothills of the great range are within sight, and the swift streams which intersect them descend from luxuriant forest country within which the long troughs between its ridges are sufficiently choked with torrent debris to form those happy valleys of pasture and parkland to which the Persian word 'paradise' applied.

The home of the Persians indeed was a group of such upland plains; and though the Persians themselves were Aryan-speaking immigrants (of no very ancient

memory), into this nook of the region for which an older name was Elam, the great mound on which 'Shushan the Palace' was eventually built for their kings testifies by its immense depth of ruins—period on period and settlement on settlement—to the great antiquity of an orderly civilization there. Other sites in similar situations to that of Susa are revealing the extent and quality of this Elamite culture, and the intensity of the struggles of its occupants in the earliest historic times to exploit alluvial Babylonia down-stream as well as their homes up the valleys.

Culture similar to that of primitive Elam has been recognized both elsewhere in the highlands and on the northern foothills of the mountain zone overlooking the Trans-Caspian steppe, and also recently in Seistan far away to the east on the great plateau. Its influence, almost as widely spread to the west, is indicated by scattered finds in the Armenian highlands, Asia Minor, Syria and Palestine; for the skill of its representatives in shaping and painting their pottery makes it exceptionally easy to recognize this aspect of their handicraft and a real continuity of culture. Pots are so fragile that in simple societies they do not travel far; if similar pottery, then, has a wide distribution, we are forced to the conclusion that it was the art itself rather than its products that was so widely diffused.

So ancient is this Elamite regime that it outlasted two whole cycles of climatic change, of the kind with which we become more familiar in regions that lie nearer the North Atlantic and were more severely affected by the advances and recessions of glacial conditions in early ages of Man's occupancy. As far to the south-east as the Elamite section of the mountain zone, the austere climatic phases for Man are those of drought and heat, not cold and moisture whether from snow or excessive rain.

And the long perspective of time with which we are here concerned is illustrated by the fact that it was apparently only during (or just after) the second cycle of prosperity that Elamite prospectors began to settle permanently in the already extensive delta-lands, and made their

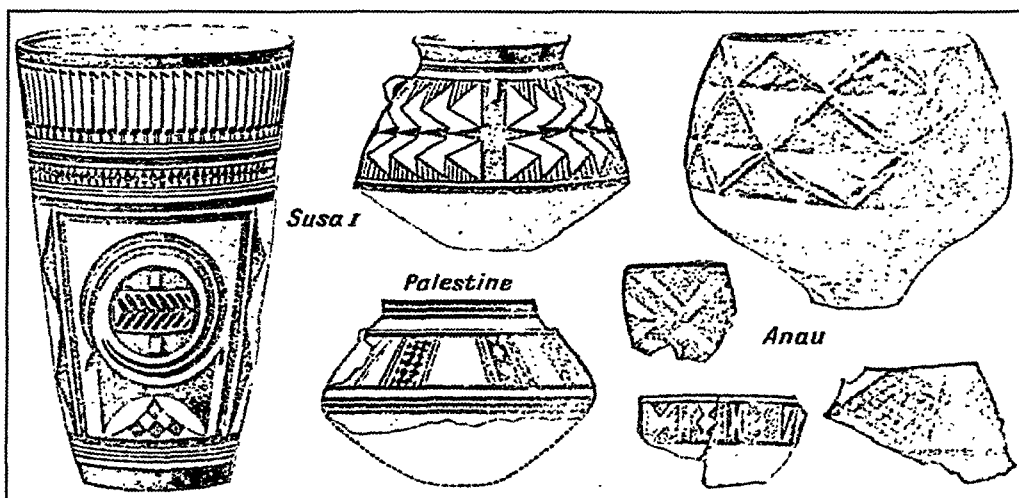
characteristic pottery there, in considerable townships built of sun-dried brick and occupied by folk with cattle-ranches and corn-fields as well as the native palm-groves. Similar settlements were coming into being up the Tigris also ; in particular a convenient site at Ashur, far out in the foothill district near its junction with the Greater Zab, marks the first attempt to colonise what afterwards was Assyria.

But all this is only one aspect of the matter. Like the mountain zone, the great flat-land of Arabia had its indigenous breed of men. It had been occupied by hunting folk since a fairly early period of the Old Stone Age, as the numerous flint implements scattered over its surface testify ; and as these people must have hunted game, the climate must then have been such as to afford pasture for animals like those that have left their remains along with similar implements in the recently explored caves of Galilee. One of those caves, it should be noted, has even yielded in addition the skull of one of these hunters themselves, as primitive and 'Neanderthal' in type as any that has been found in the cave deposits of western Europe, and quite distinct from any of the breeds of men that maintained themselves in western Asia into historic times ; though it is possible that these grim

savages lasted longer in the Nearer East than in Europe.

But by the time that the first settlements with painted pottery were established on the alluvial region, this earlier breed had been superseded by a variety of that very uniform, slightly built, long headed, brunette, wavy haired and sparsely bearded race which still dominates the whole of the southern flat-land from Morocco to the Red Sea and from the Red Sea to Mesopotamia, and is represented in this eastern region of it by the Arab type of man. Except that in a general way he is wavy haired, *Dwellers on the bearded and 'white' of Arabian plain* skin, his physical build is in strong contrast with the thick-set, broad headed, heavily bearded 'Alpine' inhabitants of the mountain zone, illustrated in an extreme form by the Anatolian or Armenian type (see page 228) ; and it is instructive to find that already in the earliest deposits which have yielded human remains in Babylonia, both these types already occur side by side, and not only so, but had already interbred.

The culture of these primitive Arabians—to call them by a merely regional name, for we know nothing yet about their language at this period—can only be inferred from the strict limits imposed on



PAINTED WARE THAT REACHED FROM THE MEDITERRANEAN TO THE OXUS

The pottery of those eastern highlanders, the proto-Elamites, who were probably among the first to colonise the new-formed delta land of Babylonia, is shown by these vessels to belong to a great family of painted ware that stretched from Syria to Turkistan. Those on the left are from the earliest period at Susa, those on the right from Anau on the edge of the Eurasian steppe.

Fr. m. Gordon Childe 'The Aryans,' H. Vincent 'Canaan' and R. Pumpelly 'Turkestan'

all human societies which inhabit treeless but grass-grown regions. Like their successors at all periods, they were pastoral and nomadic, with the facility for rapid, organized attack, ruthless exploitation of sedentary neighbours and demoralisation and collapse after short exposure to the luxury of conquest that characterise all such societies (see page 440). We know that when their range of movement became wide enough, and in particular

gums or resins exuded during the summer heat, are the stock-in-trade of the desert herbalist, on which the desert spice-merchant sharpened his business-wits, buying cheap and selling very dear, as monopolists do. Other objects of this traffic, in all ages, are rare but conspicuous and therefore 'precious' stones, including the nugget-gold from dry water-courses; eventually also the magic pearls from fisheries in the Indian Ocean, and blood-red corals from the Red Sea and the Gulf.

At the terminals of cross-desert routes, and consequently on the very margin westward of the delta land, grew up settlements such as Ur 'of the Chaldees' in quite pre-Chaldaean times; where foodstuffs, textiles and other manufactured surplus of the delta towns were warehoused against the coming of the camel-folk, and exchanged for the cargoes of the 'ship of the desert.' And seeing that the eastern mountain zone had its valued products, too, the Babylonian cities became centres of a very complicated system of trade, and amassed the wealth of the middle-man.

As the delta land was newly reclaimed, the problems of a conquered country with a servile population hardly arose; for though slaves were acquired from abroad, or by capture in war, they were

never a danger to society and could work their way to emancipation. And while there was thus no past to outlive, there seemed to be no future for which to prepare. With a singularly high sense of equity between man and man, there was little need to call in another life to redress the evils of this. 'Where a tree falls, there shall it lie,' they said; and where a man had lived, there he was buried, without pomp or apprehension; for all was now over, and his account closed with his god, as with his neighbours.

The only disturbances of these orderly, efficient and prosperous communities arose



POTTERY OF BABYLONIA'S EXPLOITERS

Comparing these proto-Elamite pots of the second Susa period with that in page 457 we note an actual deterioration. The term 'proto-Elamite' is used because the makers seem to have differed racially from the historic Elamites who played such a part in Babylonian record many centuries later.

From the Louvre

when the date palm had been introduced from the river margins into the spring-watered oases within their desert habitat, they were able to supplement their pastoral resources and the loot from their raids by profits from the transport of commodities between the settlements on the opposite edges of the desert, and in particular by their own knowledge and exploitation of desert herbs, many of which are fragrant or medicinal and consequently in great request wherever their properties are known.

Frankincense, myrrh, balm of Gilead, laudanum and a score of others, chiefly

from occasional floods, from oppressive or incompetent priest-kings, from raids out of the desert or the hill country, and (as the delta land became fully exploited) from quarrels between neighbouring cities about boundaries or water-rights. These quarrels sometimes led to temporary subjection of one city to another, and occasionally a single strong 'patesi' (priest-king) ruled all or most of the region 'in the power of his god.' But usually the god's power varied as his servants changed.

Farther north, in the region known as Akkad as distinct from Sumer in the south, the contrast between continental desert and recent alluvium was less marked, the access from desert to cultivable land was more open, and inroads of Arabian nomads more frequent. But, for the same reason, acclimatisation was easier and here the pastoral intruders had

come to stay. It is the same story as has been traced already in India and in northern China. The superior mobility and close tribal organization of the desert-men made the sedentary cultivators an easy prey, rather because of the higher culture they had created, in material respects, than in spite of it.

The Semitic dynasty finally founded by Sargon and his great son Naram-Sin (see *Chronicle I*) did not itself last long, but their principal achievement endured: Semites and Sumerians settled down into a composite people with wider ideas and more efficient organization, and spread not only their civilization but even their settlements and still more their business establishments very widely, along two main avenues in particular, up the main valleys whose waters mingled in the canals of Akkad.

The Growth of Egypt's Early Culture

HISTORICAL records in Babylonia go back beyond the days of Sargon of Agade, about 2750 B.C.; and behind this lies the long perspective of the Sumerian exploitation of the delta land, for which an upward chronological limit cannot be fixed as yet, though inscribed relics from earlier dynasties are assigned to a period about 3700 B.C. This carries history considerably further back in Sumer and its neighbourhood than is possible either in India or in China.

But the physical conditions of the Sumerian delta land make it possible to be certain that the beginning of things there does not lie much

Sumeria the New: farther back; and as

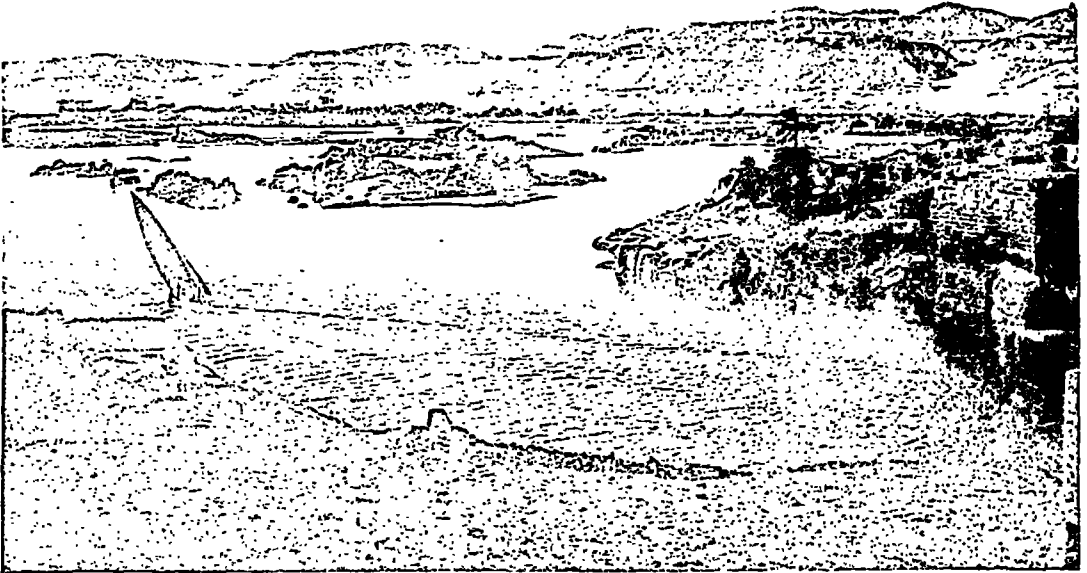
Egypt the Old the main human factors are simple and intelligible, especially in the light of the comparisons already made with the course of events in India and China, we are in a position to present, in outline at all events, the circumstances, human and physical, in which Babylonian civilization originated.

In Egypt it is different. The Nile valley is as ancient a feature in African geography as the delta land was recent in Babylonian. Even the Nile Delta was already a large region of great political

importance before the beginning of the Egyptian kingdom.

Both the desert plateau and the earlier deposits of gravel along the valley sides yield flint implements of successive periods and styles within the Old Stone Age, corresponding with those of other parts of Africa, of western Europe and of the Arabian desert and the caves of Palestine. These periods of the Old Stone Age were over, however, before the present deposits of Nile mud began. But since the mud has now covered the valley and has for some while been slowly encroaching on the lowest terraces, there is reason to suppose that the earliest relics of the New Stone Age are buried in it out of reach; and still more is it certain for the same reason that we have no knowledge at all of what was going on in the Delta, even in the latest prehistoric times.

Beyond the limits of the mud-flat, however, remains of human occupation are numerous. The earliest of them range so far back before the use of metals was habitual, and are of so antique a fashion, that it has been suggested that they supply a link with the craftsmanship of the obscure Solutrean phase of the Old Stone Age. But though this is in dispute, it is at all events certain that the characteristic



Issuing from a hinterland unknown to the ancient Egyptians, the Nile tumbles over cataracts into a steep-sided valley whose walls, nowhere more than twelve miles apart, sometimes narrow to a very few hundred yards. After five hundred miles of valley it broadens in innumerable streams over a featureless delta of rich alluvium. This photograph was taken far up the valley ; contrast it with the one below, showing the country at the apex of the Delta where the cliffs begin to fall away.



Egypt is doubly a dual land. Geographically divided into the Valley and the Delta, it also simplifies the complicated seasons of other countries into two, the flood and the rest of the year. Towards the end of June the Nile begins to rise ; the inundation reaches its maximum in October ; by May the river is at its lowest. The upper photograph shows the season of sparsest flow ; in this air view below it, the flood laps among the palms and has isolated a little village built on a knoll of higher ground.

IN VALLEY AND DELTA, DROUGHT AND FLOOD : ASPECTS OF EGYPT'S RIVER

Lower photo, Royal Air Force Official (Crown copyright)

arts and crafts of the predynastic period—that is, the period immediately before the First Dynasty of Egyptian kings, itself a long vista of development with well-marked changes of fashion, especially evident in successive styles of pottery—had a distinct and quite barbarous predecessor, which Sir Flinders Petrie calls the Badarian culture (see page 37), after the district which exhibits it best.

Between the Badarian and the predynastic cultures some crises occurred—not necessarily rapid—which differentiated the customs and industries of the valley-folk from those of Nubia and all other African regions and gave Egypt a civilization of its own, remarkably uniform from end to end of the valley and already mature in the earliest sites which are accessible to excavation.

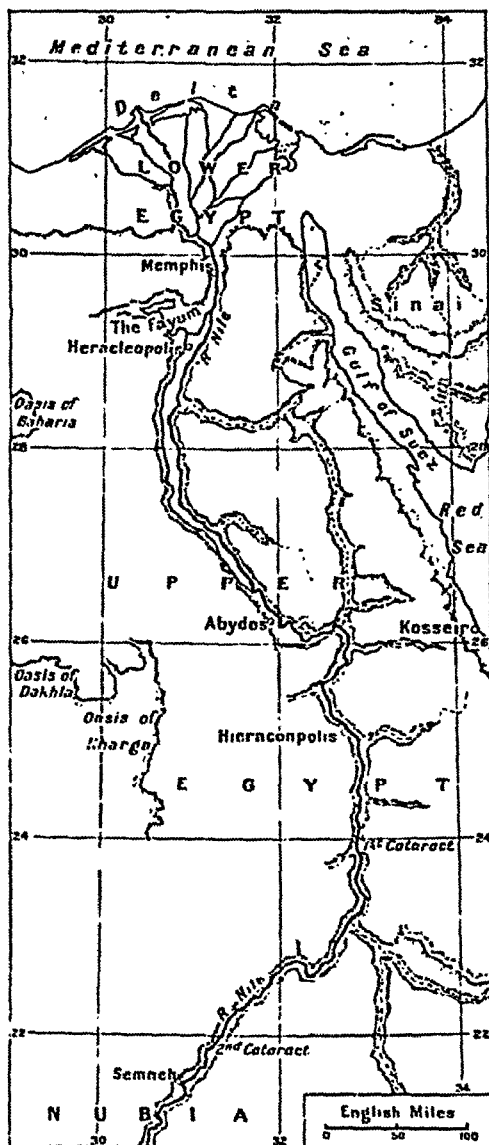
The river was navigated in boats of considerable size; barley and several other food-plants were cultivated; and oxen, sheep, goats and perhaps also ostriches were farmed. Of the settlements themselves we know little, for they were probably on the mud-flats, like the modern villages; but the tombs, to economise soil, were on the desert edge, and it is from their contents that our picture of predynastic life is reconstructed.

For, unlike the Sumerian, the Egyptian of these early days looked forward to an existence after death, and Egyptian views on After-life took painfully elaborate precautions for the well-being of the departed by

providing the corpse with all necessary and many desirable things. Later, great ingenuity was expended in conserving the body itself, and in supplying portrait models of the deceased, in case the real body should be defaced before the 'latter day.' But this was an afterthought: in the earliest burials the corpse was merely buried in a shallow grave, along with its gear.

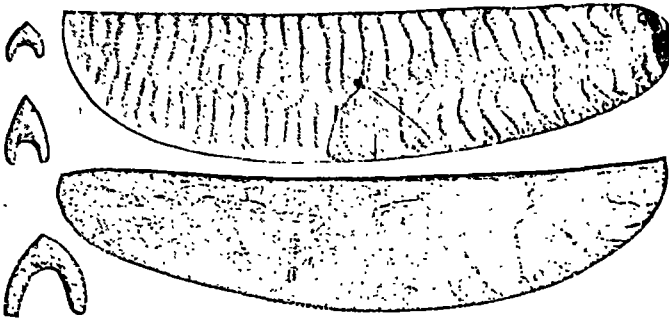
Though there is no evidence of administration on a large scale, or of elaborate worship of gods, the valley seems to have been already divided into tribal territories whose standards—on their river-craft for example—bear some of the provincial badges of historic times; and figures of animals found in some of the graves represent creatures which were worshipped

later. Occasional objects of foreign material, such as turquoise, point to distant intercourse; but the ivory was doubtless home-grown, for much of the valley was still fen and jungle, and elephant and hippopotamus are depicted in hunting scenes, as well as ostrich, giraffe and various gazelles and antelopes.



THE TWOFOLD LAND OF EGYPT

To get an idea of Egypt as it must have seemed to its 'dynastic' invaders, who appear to have come via the Delta, this map should be held upside down. The map of India in page 449 might be treated in like fashion, for its invaders, too, came from the north.



HOW NEOLITHIC EGYPT DEALT WITH FLINT

The delicacy of these flint arrow-heads and the knife above, and the skill with which a refractory material like chert has been given the serrated edge visible in the meat-cutter below, show the high cultural level of that prehistoric Egypt which, fertilised by the dynastic invaders, begot the Nile civilization.

From Sir Flinders Petrie's collection and British Museum

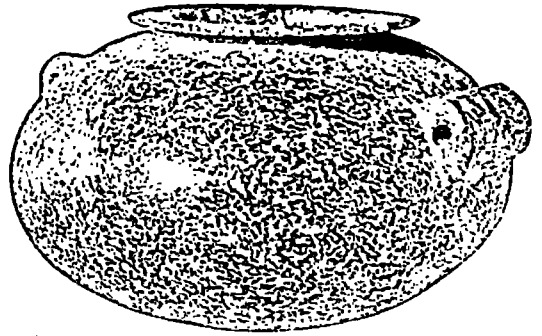
The inhabitants themselves were of uniform build, and belong to the same brown-complexioned race as the people of Arabia, of all North Africa and of most parts of Mediterranean Europe. Only at one rather late phase is there a hint of the arrival of any fresh strain as yet, and this was gradually absorbed among its neighbours. Some of the changes of fashion in the pottery, too, look like the introduction of fresh craftsmanship, but the sources of this can only be guessed at present. The breeds of cattle are peculiar, but not necessarily foreign: every people which has domesticated animals reaches its own conception of what pedigree stock should be.

The cereal crops, however, raise a difficult problem. Barley and spelt-wheat, which these people cultivated, do not grow wild in Egypt; they do, however, grow wild in a few places in North Syria and elsewhere round the margins of the Arabian desert, and it has been inferred that the knowledge of them came to Egypt from this region. But it is argued by others that the Syrian plants may be strays from cultivation plots, and that the present lack of wild species in Egypt does not disprove its existence there long ago.

Similar doubt rests at present on the origin of copper, and of the art of working in hard stones. Both occur in predynastic Egypt and in early Sumerian sites; but the relative dates are not known and the shapes of the objects not definite enough for such comparisons.

This predynastic civilization, however, is separated from that of the historic Egyptians by a period of crisis, the material evidence of which is impressive, and its historic aspect is now becoming fairly clear. The first historical dynasty of Egypt had its seat at Abydos, far up the valley, and it was probably only kings of the Third Dynasty that began to govern from Memphis, near the junction of valley and delta, and to build their tombs there.

Formerly it was supposed, from the southern position of the dynastic capital at Abydos, and also from its accessibility from the port of Kosseir on the Red Sea by a caravan route, that the new regime was initiated by 'Horus worshippers' originating from Arabia, and therefore assumed to be Semitic; and that the shift of their headquarters from Abydos to Memphis marked a stage in their policy of unification of Valley with Delta. But the study of the remains of many thousand individuals from early graves shows a sudden and progressive introduction of a foreign people, of Asiatic breed, akin to that broad-built type which has occupied the mountain zone from the earliest times and had spread into Palestine during the later Stone Age. In Egypt these newcomers become more numerous and more widespread up the valley until the Fourth Dynasty, and thereafter become absorbed



A MARVEL OF PREHISTORIC STONE-WORK

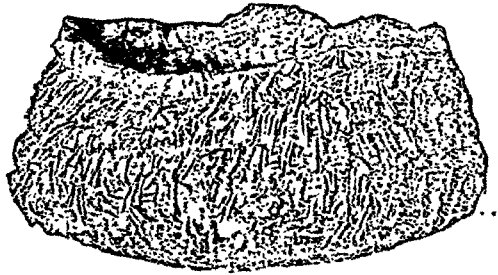
This bowl of syenite illustrates the positive genius of the predynastic Egyptian stone-worker. Though two feet across, and made of a peculiarly hard and heavy material, it has been ground so thin that it is quite easy to lift.

From Quibell, 'Hierakonpolis'

in the mass of the population, appreciably modifying its average type.

As their first appearance was a little before the establishment of the First Dynasty, and in the lower part of the valley, it is reasonable to connect their appearance there with the political revolution which followed, though the dearth of accessible sites in the Delta makes certainty unattainable at present. The worship of Osiris, however, which eventually became a central fact of official Egyptian religion, presents features which suggest that it originated in a land of pastures, of coniferous trees and of other vegetation quite alien to Egyptian conditions; and the use of the same hieroglyphic sign for right-hand and for west suggests that the first users of it 'had their faces toward the south' when they occupied the valley.

Pastoral people descending from an adjacent highland or other austerer surroundings, where agriculture was only possible locally, into a region of alien, sedentary folk whose culture was more highly developed in material respects, because the physical conditions were more favourable, are by this time a familiar symptom, and probably the cause of such a political reorganization of an older people into a nation with a temperament, ideals and customs of its own. We have seen the symptom in China, in India, in the Semitic reconstruction of Sumer and Akkad into what was to become Baby-



STORING CORN IN EGYPT

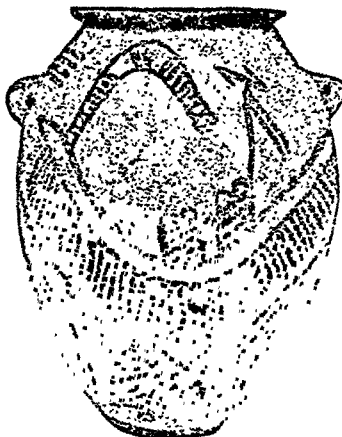
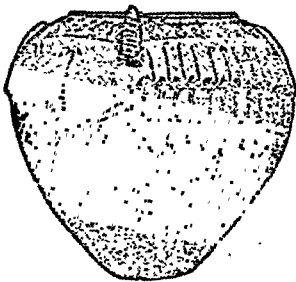
Agriculture was practised in predynastic Egypt, as is proved by woven-grass linings of storage pits with grains of wheat and barley discovered among the meshes. The question of priority between Egypt and Babylonia is in dispute.

From Sir Flinders Petrie's collection

lonia. In Egypt the evidence, copious as it is, fails us at some of the most important points, and it is only the fortunate accident that we are able, here alone, to examine abundant remains of the people themselves, that makes the conclusion certain that in Egypt, too, the initial process was essentially the same.

In China and in Babylonia, as we have seen, the process of infiltration of new stocks and new modes of living was intermittent; in China always from the same quarter, the Mongolian plateau, in Babylonia from at least three different sides. In Egypt, as in India, the invaders, once arrived, were able to work out their own destiny almost undisturbed for a very long time.

Much as, in India, there was an occasional set-back through the rise of powerful chiefs in the unconquered south or among the unprivileged masses, so too in Egypt there was occasional reaction against the dominant culture and its administrators, and occasional conquest more or less complete by warrior folk from Nubia or the Sudan, imperfectly civilized from Egypt itself and acquainted thereby with its immense resources and also with the weakness of its actual rulers. And much as, in India, Aryan expansion was checked and modified eastwards by inde-



EARLY EGYPTIAN LIFE REVEALED BY POTTERY

The fondness of the predynastic Egyptian for subject decoration on his vases gives many clues to his culture. The left-hand vase suggests that ostrich farming may have been among his occupations, and the boats with tribal badge on a standard prove an early proficiency in the navigation of the Nile.

From the British Museum

pendent intruders of Mongolian origin at the other end of the Himalayan chain, so in Egypt the inheritors of Asiatic traditions were in recurrent danger from the mainly pastoral Libyans beyond the western edge of the Delta, who repeatedly established themselves on this side of Lower Egypt and occasionally threatened the valley.

Internally, also, the social structure of Egypt went repeatedly through the same kind of phases as

Social phases in that of Aryan India, and Egyptian History also of northern China.

The initial vigour and freedom, in art, in religious inspiration and in centralised administration, which culminated in the achievements of the Fourth Dynasty (the Pyramid Kings), of the Twelfth, of the Eighteenth and of the Twenty-sixth, gave place to a more and more rigid conventionalism which paralysed alike the freedom of the craftsman, the self-mastery of the individual worshipper and the efficiency of government.

What the notion of personal purity was to the Aryan in India, preoccupation

with the future fate of soul and of body was to the Egyptian. And the result was that the Egyptian priesthoods, both in great temple corporations and as chantry priests maintained by pious endowments on every large estate, became a social restraint and on occasion a cause of political disturbance, through the monopoly they claimed of the sources of life after death, as dangerous as the Brahmin monopoly of the means to attain purity.

And just as in China the provincial magnates, in Babylonia the patesis of the great cities and in India the territorial dynasties were the recurring obstacle to any kind of larger nationalism or to the greater achievements which such co-operation might have secured, so in Egypt the territorial nobility were the perennial critics of the Pharaoh and frequently rebelled against him. At the same time they were so jealous rivals of the temple-priesthoods that it was the traditional policy of the Crown to play off one set of interests against the other, much as medieval kings played off the Church against the barons.

Sources of Civilization in the Aegean Islands

THERE remains to discuss one other cradle of early civilization—a civilization more derivative, indeed, and not so independent as the four river-basin cultures already described, but of great interest owing to its completely different geographical surroundings and to its closer connexion with Western development. This is the Mediterranean, or, more accurately, the Aegean.

Our survey of the great civilizations of the Nearer and the Farther East shows them to have, beneath all the variety and originality of their achievements, certain broad similarities of origin and circumstance. In particular, they all arose within great continental land masses, and were sustained, so far as material maintenance went, by the copious and perennial water supply of great rivers. It may indeed be that the fundamental invention which made possible those aggregations of humanity out of all proportion to the average density of population—taking the habitable sur-

face of the Earth as a whole—was the domestication of flowing water, and its redistribution under intelligent control, so as to extend and intensify the fertility of the land far beyond the fen margin.

What happened to this great flow of water was, however, of as little concern to the men who inhabited the river-banks as the question whence it came. It came, of course, out of the hills, tumultuously, or as in Egypt from a

rugged gorge with rapids Rivers and their and cataracts, and was use by Man quite useless till its current

slackened in the low ground. At the lower end of its course, the country was more or less waterlogged, too swampy for reclamation; land and water were hardly distinguished yet, as in Babylonian and Hebrew accounts of the origin of all things. The channels shifted among mudbanks and reed brake; there was almost no current at all; and the water was brackish and foul.

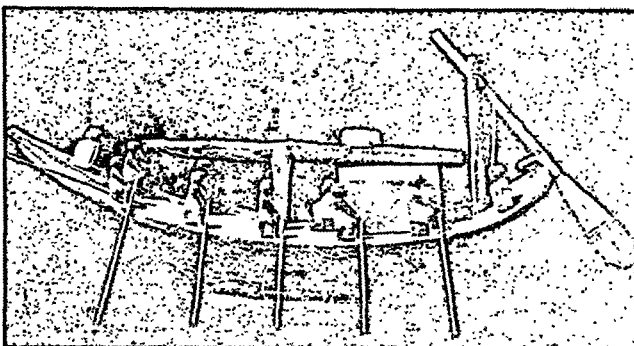
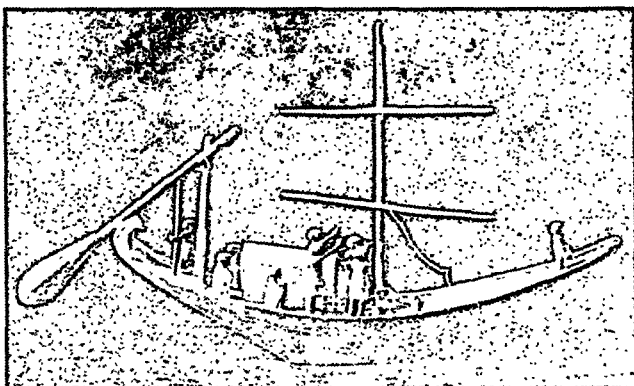
In mid-course, however, and among the habitations of men, the great rivers

had another aspect, as a means of intercourse by boat—down-stream, on the mere current; in the reverse direction with the help of oar and sail; for in Egypt, and on the Chinese rivers especially, prevalent or seasonal winds blow up-stream. This second use of water as a thoroughfare certainly began in Egypt long before the country was unified politically.

Though this means of transport gave little help on the swifter-flowing current up-stream, it made possible the exploration of the fenland, where there were fish and water-fowl, and also patches of grazing ground for cattle; and both Egypt and Babylonia made early use of the fens in this way. Eventually, passing beyond the delta country, the men of the river valleys made acquaintance with the sea.

Now the seas into which the great rivers of the Old World empty themselves differ greatly in quality. The China Sea and the Indian Ocean are open expanses, with stretches of inhospitable coast that are treacherously tidal, and long seasons of the year when the monsoon blows landward so strongly that navigation is perilous; moreover, though coast-wise voyages are possible at other seasons, there is nothing visible to seaward, and little inducement to tempt fortune in this direction. It was very long, for example, before Chinese seafarers made contact even with the island world of Japan, Formosa or the Philippines.

The Babylonian rivers fall into the choked and shallow end of the Persian Gulf, almost tideless, and in all respects more easily navigable than the ocean. But the Persian Gulf also has inhospitable shores, mountainous eastward and desert on the west, and the transition at the strait from gulf to ocean is abrupt and complicated by the tide-race; also



HOW THE NILE WAS NAVIGATED

On Chinese rivers and on the Nile the seasonal winds blow up-stream; hence sails could be used to overcome the current (top), while for the return journey the mast was unstepped, the sail furled round it, and fairly leisurely oarage sufficed (bottom). These models of ships, complete with sailors and look-out, came from a Twelfth Dynasty Egyptian tomb

From Sir Flinders Petrie, 'Gizeh and Rifeh'

the Mekran coast is rugged and barren, and the wealth even of Hadramaut, tropical and monsoon-watered, lies beyond a coast range with few passes; it has almost no ports, and a monsoon-driven surf for nearly half the year. No wonder that the sea counted for little in these continental regimes, and that in India and China the infringement, by seafaring strangers, of the seclusion so long enjoyed was a shock from which there seems still no prospect of recovery.

Egypt fared differently, and this is the main reason why the civilization of ancient Egypt stands in a different and more intimate relation with the eventual main course of human advancement. For the sea beyond the Delta frontage was neither open tide-swept ocean, nor a land-locked, mud-choked cul-de-sac like the Persian Gulf, but the largest of a great group of

lake basins which have had somewhat the same effects on the land regions around them as the lake region of North America, but on a far larger and profounder scale.

Geographically, this lake land includes not only the eastern Mediterranean with its Aegean and Adriatic gulfs, and the western Mediterranean beyond the transverse land-ridge formed by Italy, Sicily and Tunis, but also the Black Sea, with its vestibule the Sea of Marmora and its rearward appendage the Sea of Azov. It includes further the Caspian and the Aral Sea, remote and insignificant historically, but abiding evidence of the fact that once a kind of Lake Superior on a gigantic scale extended from the Carpathians to the foothills of the Central Asian plateau, and discharged its surplus water over a vaster Niagara at the Bosphorus till that barrier was worn down, as Niagara is destroying its own magnificence now.

That barrier at the Bosphorus had come into being in the course of construction of the great mountain zone which crosses the lake region from east to west, from the Pyrenees and the Atlas, through Alpine, Carpathian, and Dalmatian ranges, into Asia Minor and Armenia, whence it bifurcates once more to embrace the Persian plateaux and reunite in the 'Roof of the World.'

Of the principal lake basins, the West Mediterranean lies wholly within the embrace of the mountain ranges; the Black Sea and the Caspian partly within, the Aegean partly to north of them; the East Mediterranean wholly outside to the south. But the two annexes of this East Mediterranean, the Adriatic and the Aegean, penetrate deeply among the mountain ranges. In the Aegean a whole section of the mountain zone itself has collapsed.

Within this submerged section of the highland, the depression is naturally greater seawards, and diminishes towards the unshattered highlands on either side. The coast lines are therefore very irregular, with drowned valleys between rugged promontories prolonged into deep water by chains of islands and reefs. But across the middle of the sunken area, and dividing its Thracian from its Cretan basin, the peaks of a considerable mountain chain form the Cyclades islands, the largest of which, Naxos, is well nicknamed among its neighbours 'The Little Crete.'

In this midland region within the Mediterranean Sea, the peculiar configuration, climate and general conditions of life which characterise the Mediterranean lands as a whole, and which are described in pages 343 to 346 of Chapter 9, are exhibited with typical precision.

A characteristic combination of dry-land cereals (especially wheat and barley) with milk products on the one hand



WHERE THE AEGEAN CULTURE THROVE

In the sea-drowned section of the mountain zone known as the Aegean, it is obvious that the intercourse necessary for cultural advancement must have come by ship; and, as we should expect, influence from several directions can be traced in the early civilization of this diverse island world.

and tree fruits on the other—including in the latter group the all-important oil and wine—is the foundation of human subsistence throughout the Mediterranean lands. On the African shore, it is true, there are neither mountains nor rivers between Tunis in the west and Nile and Lebanon eastward, and pastoral life predominates; but even here, within reach of the Mediterranean rainfall, the pastorals are not nomads. Though they live in tents, they have their patch of garden ground and fruit-trees; and until the Arab devastation Roman Africa was one of the Empire's granaries.

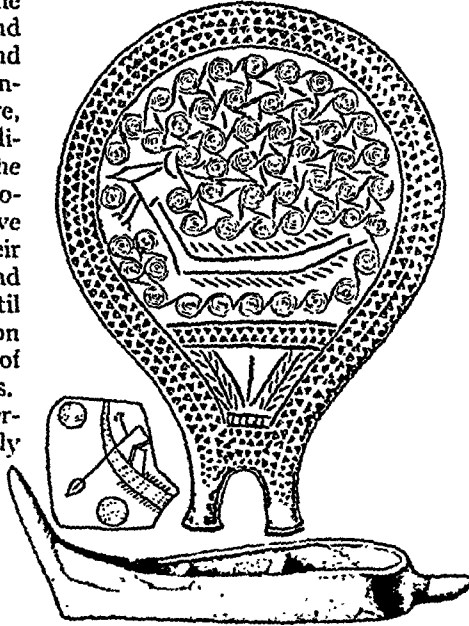
It will easily be understood that in essentially mountainous country—however near the sea level its peaks and valleys may have sunk—only a small proportion of the surface is habitable except by a few hunters and shepherds; and those habitable areas lie like oases in a wilderness of rock and scrub land, insulated from each other by steep ridges, and in fact often communicating more easily between gulf and gulf by sea.

Much of the region had originally been forest; and in spite of many centuries of tree felling, for the use of the greater settlements, there is still magnificent timber locally in Albania, in Mount Athos, in the wilder parts of Lycia and 'Rough' Cilicia. Formerly Cyprus, the Lebanon and other parts of North Syria were famous sources of timber. The fact of this ancient abundance of forest needs to be emphasised, partly because it is in this respect that human occupation has most completely changed the look of the country, and looted its

resources; partly because timber has been at all times a rarity in Egypt, and undoubtedly some of the earliest intercourse between Egypt and oversea countries was an attempt to satisfy this need.

The Mediterranean is so nearly cut off

from the Atlantic and so limited in its own extent, that it has hardly any tide. This greatly facilitated seafaring at all periods, and the rarity of navigable rivers made the lack of tidal estuaries less inconvenient than it might otherwise have been. On the other hand, there are perceptible currents; in particular a general counter-clockwise circulation, which carries boats issuing from the Nile mouths along the Syrian coast, and then past Cyprus to the south coast of Asia Minor and Crete. Even in Roman times the course of S. Paul's voyage from Caesarea to Rome illustrates the use made of this drift. Coastwise navigation is aided further by the



LINKS THAT BOUND THE AEGEAN

The circumstances of Aegean civilization argue proficient seamanship. Boats engraved on pottery from early sites in the islands show steering paddle and many oars; one here bears a fish ensign. Their build is confirmed by a clay model from Palaikastro in eastern Crete.

From V. Gordon Childe, *Dawn of European Civilization*

daily alternation of land and sea breezes, especially where the coast stands high, and the land cools sharply at night.

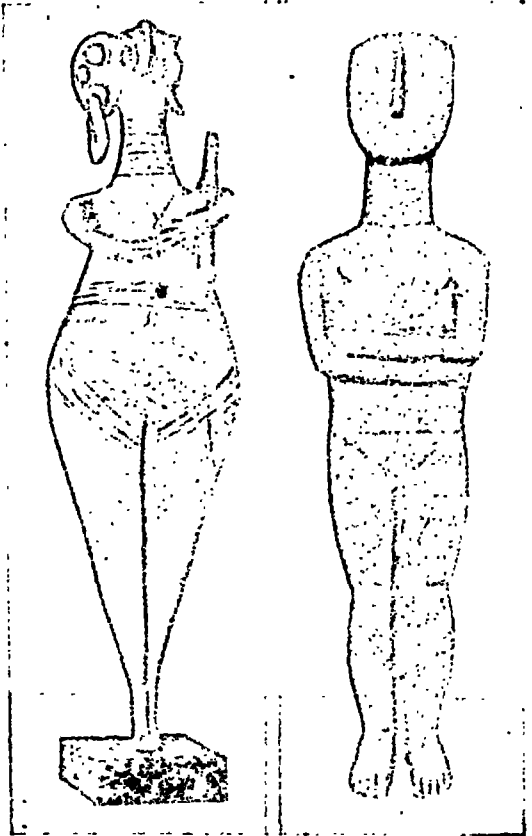
Consequently early navigators from the Delta had every facility for approaching the Syrian coast first, and Egyptian acquaintance with Byblus, and probably with other Phoenician ports, can be traced back to the Third Dynasty. The great bend of the coast between Syria and Cilicia was also discovered early. Thus far, there is no special reason to suppose that Egyptians reached the Aegean either early or often, though clearly the outward voyage was not beyond the capacity of seamen who frequented Byblus.

What is significant is the facility for return. All through the summer months a steady wind from the north blows from

the Black Sea region into the overheated Sahara : in the Aegean it is a little north-easterly, but in the Levant the similar updraught of Arabia pulls it round to the north-west. From Rhodes and the east end of Crete, therefore, it is plain sailing to the mouths of the Nile, and if the voyager makes the Libyan coast anywhere west of the Delta, the current and the shore breezes soon put him at home.

It is a further question, if and when Egyptian seamen reached Aegean lands on a round trip of this kind, what sort of people and mode of life they encountered there. Here the actual remains of Aegean peoples, from early tombs in Crete and the Cycladic islands, give an important clue, which is in accord with the general trend of the evidence for later times. The mountain zone, and the great flatlands of North Africa and Arabia, have each their own breed of men, long established, and in Africa at all events traceable back into Palaeolithic times ; for it was with men of this North African breed that large regions of western Europe were re-peopled in the later part of the Old Stone Age.

All through the mountain zone its own peculiar type—or group of types, for there are varieties more or less highly specialised, which seem to emanate from a central nursery in the Armenian highlands—constitutes the great mass of the population throughout historic times, and has been steadily increasing its range, overflowing for example into peninsular Italy, and widely into east-central and west-central Europe north of the mountain zone. It would be natural therefore to expect that



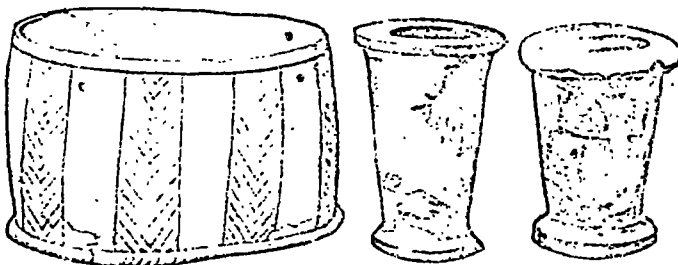
SOURCES OF AEGEAN INSPIRATION

The frequent occurrence of corpulent female statuettes in the Aegean (left : terra-cotta from Cyprus) suggests relations with the west. A slimmer type, however (right : marble from the Cyclades), may point to influence from Babylonia.

From the British Museum

it would dominate the shores of the Aegean from the first.

But, in fact, this is not so. Eurafrian man (or 'Mediterranean,' as he is commonly called) is found established in Crete and in some of the Cyclades at the very beginning of the Bronze Age, and throughout ancient times the Greek-speaking population of the Aegean coast lands remained far more Mediterranean in type than the geographical position would have suggested. Moreover this occupation was already old when we can first trace it, for side by side with fairly pure Mediterraneans and Alpines there are mongrel individuals whose remains combine certain characters of both.



EGYPTIAN INFLUENCE IN CRETE

Crete, owing to its southerly position, was more exposed to influences from North Africa and Egypt than the other Aegean islands. Thus the basket-work decoration of the bowl on the left is reminiscent of styles that have long characterised the Libyan coast ; while the pot has plenty of Egyptian parallels.

From Professor Xanthoudides, Vaulted Tombs of Messara

To account, therefore, for the presence of Mediterranean men in the Aegean we must presume a knowledge of navigation both early and proficient. This inference is supported by features of early Aegean culture, most easily recognizable in Crete, but perceptible also in the Cyclades.

Below the oldest foundations of the Bronze Age palace at Cnossus lie the remains of neolithic settlements accumulated to a depth of more than twenty feet, and illustrating a long period of slow advance in culture. The

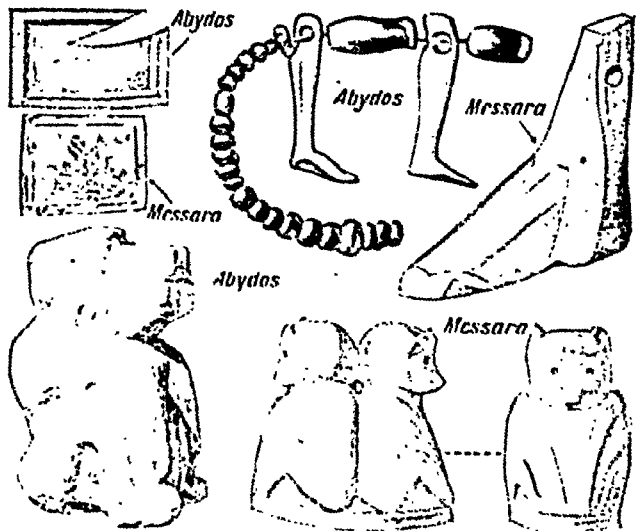
stone implements resemble those of Asia Minor and peninsular Greece; but the pottery belongs to a type which is widely spread round the Mediterranean shores from the Syrian coast to Sicily, Malta and Sardinia, and moreover betrays the same dependence on basket work for its ornament, which is characteristic of traditional schools of ornament throughout North Africa. The popularity of female statuettes, excessively corpulent, suggests the prevalence of similar tastes or beliefs to those of neolithic Malta. Occasional objects of shell (from the Indian Ocean) are clearer proof of intercourse with people who had access to those waters. There is, however, nothing yet which demonstrates direct communication with Egypt.

In due course the use of copper and bronze reached these Aegean settlements, and therewith events began to move rapidly. Neither Crete nor the Cyclades possess any such resources of metallic ores as Cyprus, or North Syria, and the first Aegean types of bronze implements are borrowed; in the Cyclades from Asia Minor, and from a repertoire which has a wide distribution into east-central Europe also. In Crete, on the other hand, the principal foreign influences are from North Africa. But the considerable influence exercised for a while by the Cyclades

on the culture of Crete suggests that there was here some source of inspiration other than that enjoyed by the larger island.

In Crete specifically Egyptian objects begin to appear. These are all more or less luxuries, and as there is at present no evidence that Crete contributed to Egypt in similar ways, we may infer that the return cargo was some kind of raw material, or consumable stores; the timber, oil, wine already mentioned, are obviously in this class. Cyprus and Phoenicia similarly were supplying Egypt with such 'invisible imports,' while receiving goods which have endured till to-day.

Naturally, as the occupants of Crete achieved their eventual mastery over the manifold resources of this great island, their prosperity and the range of their influence grew, and gave them prolonged predominance over their Cycladic neighbours. But in the earliest period each group of settlements developed in the main separately, and it was the Cyclades which lay in the more favourable position for exploring adjacent districts of the Greek mainland, communicating their own experience and skill to them and probably also learning from the 'painted ware' culture which was already



CRETAN TRINKETS WITH EGYPTIAN PARALLELS

The most striking examples of Egyptian influence on Crete appear in luxury objects, amulets and the like, of which we may surmise that Egyptian imports largely consisted. Compare these leg-amulets and monkeys found in the Messara tombs (Crete) with their prototypes from Abydos (Upper Egypt).

From Nauthoudides, 'Messara,' and Petrie, 'Royal Tombs'

ancient there, derived it seems, from the open country east of the Carpathians.

It is in the Cyclades also that we trace more clearly the interaction of elements derived from the Asiatic mainland, with survivals of the stone age culture of the south. Account must also be taken of the natural resources of the islands themselves, and especially of their obsidian, marble and other desirable minerals; for Siphnos had gold, and several islands ores of silver and lead. For copper they were

probably dependent on Asia Minor, and in part at least on Cyprus. Between distinct but neighbouring communities there was certainly intercourse and probably rivalry, to stimulate craftsmanship.

Thus came into being the culture, to the Cretan variety of which Sir Arthur Evans has applied the name 'Minoan,' borrowed from the legendary sea king Minos, the first 'ruler of the waves' in the Aegean. Its further history must be reserved for treatment in Chapters 19 and 25.

Conclusion : Features of Early Civilizations

NOTHING has been said here about the two principal civilizations of the New World—in Central America, especially in Mexico, and in the Andean highlands of the Inca Empire. But in spite of the profound contrast resulting from Man's failure to domesticate the American bison, and from the total absence of the horse and other beasts of burden except the llama, the successive descents of Toltec and Aztec conquerors out of the south-eastern regions of North America—dry, featureless and exposed to periodic fluctuations of climate—into the moister and more fertile oases of Mexico and the cultivable clearings of the Isthmus forest region offer obvious analogies to the processes of civilization in the Old World. So too does the spread of the Inca empire from a highland plateau towards forest and lowland. But it is too early for more than the most tentative application of our general conclusions to the perplexing phenomena of the New World.

It remains now, after even so brief a survey of the conditions in which these various cultures arose, to make a few elementary comparisons between them, and suggest a general description of the processes by which they all alike came into being.

On their economic side all the four river-valley civilizations have in common one fundamental character. They depended, in their maturer phases at all events, and in three out of the four from their first beginnings, on the control assumed by the men who created them over a single physical factor in their natural surroundings. This was the perennial water supply of great rivers

which all—though for different reasons—reach their maximum annual flow at the season when the growth of vegetation is most vigorous, provided that water is available, but least possible if water is withheld.

Now it is the essential distinction between barbarism and civilization that in the former state men live as they must, while in the latter they live as they know how: 'the distinction between them,' to quote the German geographer, Ratzel, 'consists not in the *degree*, but in the *kind* of their connexion with nature.' Culture indeed might be described in general as Man's state when liberated from natural controls; not in the sense of complete freedom from such controls, but in the sense of wider, more manifold and more intimate interaction between Man and nature.

There have been three main stages in Man's *dominion over the land* on which he lives and by whose produce he maintains and comforts himself. *Stages in Man's Conquest of Earth*
In the first, he leaves the soil as he finds it and is restricted therefore to nature's own yield of self-sown, uncultivated fruits. In the second he transforms the soil by digging and ploughing, and either selects among the natural growth the kinds he prefers for his own purposes, treating the rest as 'weeds' (which, as has been said, are 'God's plants, growing where man does not want them'), or else wholly substitutes special crops of his own breeding.

Only in the third stage does he explore beneath the surface, and make mineral

resources his reservoir not of maintenance but of power ; arming himself for defence and for aggression, against natural dangers and obstacles no less than against his fellow men, and supplementing his own small strength by longer arms, swifter feet, defter fingers and subtler signals for co-operation with his fellows than his physical frame provides.

There have also been three main stages in Man's assumption of control over water. In the first, water is utilised for production ; in the second, for transport ; in the third, not fully realized yet, for power. The riverside cultures result from the first of these, by the redistribution of naturally flowing water through artificial channels so as to moisten land which it does not naturally reach.

But it is not the originality, still less the spontaneity, of the river cultures which has most impressed popular imagination ; but rather the immemorial massive stability of the social organization which they are credited with achieving. Men have marvelled at the rigid limits within which Egypt and Babylonia, and in general also India and China,

Massive stability of River Cultures were confined as regards population, nationality and specific regime ; and, on the other hand, at the helpless collapse of their political superstructure—in Babylonia, of its economic foundations also—as soon as alien, uncongenial men broke through the geographical and political barriers which secluded these cultures, deranging their quite artificial basis.

Less obvious to the public, but most significant of all to the modern statesman, is the amazing persistence of the social foundations of such regimes, in Egypt, India and China, and the recuperability even of Babylonia so soon as the initial step of establishing water-control has been repeated. This persistence is due to the fact that, in Egypt for example, successive new masters of the country, Persians, Greeks, Arabs, and in our own day Europeans, have been intelligent enough to let well alone in this all-important matter. In Babylonia, on the other hand, it was the neglect of a single such master, at the Mongol conquest of Bagdad, that wrecked in one generation what the prudence of the

others had conserved for four thousand years ; and the Turkish administration of Egypt nearly caused a similar disaster.

Perennial water-supply, then, in irrigable land, on a sufficiently large scale to maintain a considerable surplus of population besides the actual cultivators, enabled the latter to enjoy conveniences and even luxuries provided by the craftsmanship of those others, and also the immaterial amenities

Civilization the Gift of Water which leisure alone can supply : poetry, music and the fruits of meditation. And communities as composite as these acquired other elements of civilization, at the risk of perishing for lack of them.

Chief among such are, first, organized production of surplus commodities required for exchange with the surplus produces of other regions, foodstuffs and manufactured articles paying for articles of luxury or occasional use, such as drugs and gems ; or invisible imports, such as security for travellers, purchased by blackmail to bandits. Secondly, there is organized defence against external enemies, and also against that predatory adventurer within the gates, the ubiquitous profiteer ; hence the systematic administration of justice and the consolidation of normal behaviour into codes of law, with penalties for breach of wholesome usages. Thirdly, in all cases, and usually quite at the outset, there is an organized device for communicating information and instructions, by means of a system of writing ; used also eventually to perpetuate and accumulate experience, useful knowledge of various kinds and works of verbal art which otherwise hover precariously between lip and ear, or perish at their creation. Music, however, had to wait till Greek times for a notation. Cumulative record of events led easily to the appreciation of sequences in time ; to the invention of an accepted calendar, and to great advances in astronomical observation. Fourthly, organized agriculture and commerce required accurate apportionment—of land, materials and commodities, by measures of length, area and capacity ; of labour by measures of time ; of produce, by weights ; and of the relative value of all these by scales of wage and profit.

These great discoveries, once made, were necessarily sanctioned and maintained by political administration. Now in all the great river cultures government was fundamentally theocratic; that is to say, the actual human governor, whatever the history of his acquisition of public authority, claimed for his words and deeds the sanction of a divine superior, usually recognizable as one of the greater forces or facts of nature, though in China the Shang-ti, or supreme deity, is already almost wholly stripped of such attributes when we first encounter him.

Of such theocratic systems the most familiar to ourselves is that which is proclaimed in the Ten Commandments of the Mosaic Law. On the one hand, there is the duty of the individual towards his God, which is positive except where it forbids practices inconsistent with a right notion of godhead; on the other, his duty towards his neighbour, which is almost wholly negative, the sole 'commandment with promise' being that which sanctions the foundations of society

Ethics of a
theocratic state itself, as Confucius too sanctioned it, in right conduct within the natural family—'Honour thy father and thy mother, that it may be well with thee.' The negative character of political and social duties results in part from the primitive equipment of fears and restraints which is characteristic of simple societies, and is only dissipated when experience and reason combine to prove that things traditionally taboo, or as we say 'not done,' may be done without disaster, provided they are done with knowledge of the circumstances and self-restraint founded on this knowledge.

This rational claim to individual freedom of choice, however, comes late, if ever, in the development of theocratic cultures, and always as a protest against a jungle of prohibitions through which no way seems left. For the men of the theocratic cultures, their God is a 'jealous God,' exercising and guarding a monopoly of wisdom, and therefore of power, like that claimed so disastrously by his earthly representatives. As with a capricious ruler, many of 'his ways are past finding out': while his justice may be tempered with mercy, you

may tamper with it by gifts provided that you know how.

Under such a government human initiative and human reason took subordinate place; they were resources to be employed discreetly, lest they thwart unawares the divine government of the realm of nature and of 'The Opinion of - Sensible Men' in Greek thought (see Chap. 39) that law is at the same time the 'gift of the gods' and the 'opinion of sensible men,' justifiable before the judgement seat of common sense. It was indeed this 'opinion of sensible men' that the Greek felt to be missing in the kingdoms of the East as he knew them, just as Confucius found it wanting in China, the Buddha in Nepal, and Hammurabi in Sumer and Akkad.

Behind these real, though superficial, resemblances, however, there stands in each of the great ancient civilizations the same fundamental cause both of their stability and of their failure to proceed beyond a quite definite degree of organized welfare: namely, the fact that they each rested on exceptionally complete acclimatisation throughout a group of people, originally homogeneous and acclimatised to a more ancient home, but transposed into quite different circumstances in a new region where it was necessary, if they were to maintain themselves at all, that they should accept their fortunes as they found them.

This effort of adjustment involved more or less complete, and sometimes deliberate, discarding of traditional ways of living, the invention of fresh devices, the acquisition of new habits and beliefs. But it resulted also in unforeseen survival and adaptation of ancient behaviour, and the perpetuation of tribal or national convictions among novel surroundings, until some kind of working compromise was attained, sometimes very special and strictly defined, like the daily round of the rice grower, where deviation leads straight to disaster. In this aspect, as the sum total and result of efforts and aspirations in innumerable living personalities, the rise of a great civilization ceases to be 'ancient history' and takes place in that experience of life which is open to us all.



WATCHFUL AND INTENT ON HIS WORK : THE SPLENDID SEATED SCRIBE

Even among the outstanding subjects selected in these eight pages to represent the qualities of Old Kingdom Egyptian sculpture, this seated scribe must take pride of place. He is of painted limestone (black hair, brown flesh, white papyrus roll), with eyes of alabaster, rock crystal and copper.

The Louvre



LIFELIKE WOODEN STATUE OF A FIFTH DYNASTY OFFICIAL

Found in his tomb at Sakkara, the Fifth Dynasty wooden statue of Ka-aper so impressed the native workmen with its lifelike effect of burly authority that they christened it the Sheikh el-Beled, from a resemblance to a village headman. Staff and part of the legs are restored.

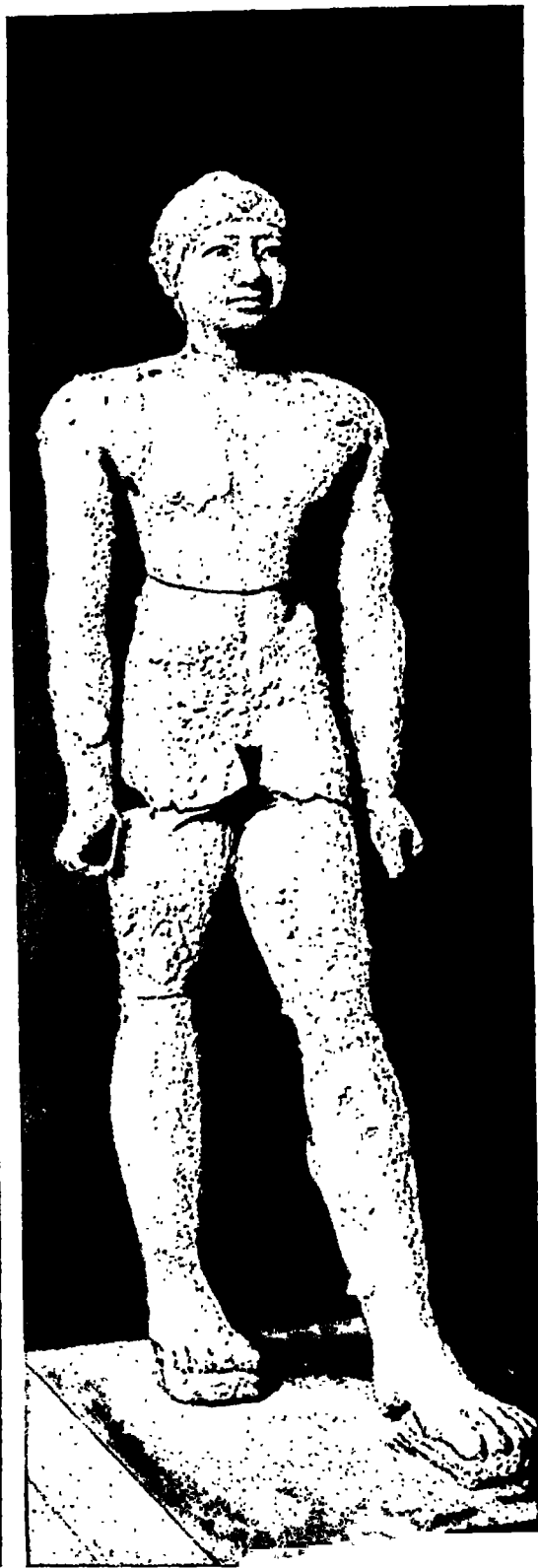
Cairo Museum



DIGNIFIED FUNERARY PORTRAITURE OF A PRIESTLY NOBLE

Ra-nefer, high priest at Memphis during the Fifth Dynasty, was buried at Sakkara and his tomb furnished with this extraordinarily vital statue of painted limestone, complete save for the nose, which is restored. It well shows the method of wearing the simple kirtle, fastened with a pin-buckle.

Cairo Museum



COPPER USED FOR PORTRAIT STATUARY IN THE SIXTH DYNASTY

The wonderful statues of Pepi I and his son Meren-ra from Hieraconpolis (that of Meren-ra is given again on the left in its correct relative proportions) command unique interest as being of copper. The heads were cast, the rest hammered separately and riveted together, and the eyes inlaid.

Cairo Museum



MENKAURA IN THE EMBRACE OF TUTELARY GODDESSES

King Menkaura's mortuary temple at Gizeh was adorned with several groups of a slate-like green stone. In this the king wears the crown of Upper Egypt and is protected by Hathor (left) and the tutelary deity of the Cynopolite nome; other nome-goddesses appear in the other triads.

Boston Museum of Fine Arts



REGAL MEMORIAL TO THE BUILDER OF THE SECOND PYRAMID

Royal statuary has never exceeded in dignity this diorite portrait of King Khafra, from the temple that stood before his pyramid at Gizeh. On his chin is the conventional royal beard ; behind him, protecting his head with its wings but invisible from in front, there perches the divine falcon.

Cairo Museum

EARLY EGYPTIAN LIFE & CULTURE

The Civilization of the Nile in Predynastic Times and its Flowering under the Old Kingdom

By T. ERIC PEET

Brunner Professor of Egyptology in the University of Liverpool; Author of *Egypt and the Old Testament*, *The City of Akhenaten*, etc.

It is often said that the character of a nation is the product of the environment in which it lives. If it be meant by this that, given an environment, it is possible to forecast the character of any people compelled to dwell there, the statement is untrue, for it makes no allowance for the human element, the initiative of individuals and groups. If on the other hand it means that, given an environment and a nation in it, we can see how certain of the traits which develop in the nation are directly traceable to the environment, then the statement is a sound one. Nowhere could it be better exemplified than in Egypt. Here is a country the physical conditions of which are unique. A priori it might have been safely said that it would produce a unique people, as indeed it did; but in what sense unique no one could have foretold, for that depends on another element, the human. At the same time there is no country where we can watch more easily the effect of surroundings on character and conduct than in Egypt.

The physical characteristics of the country are easily described. It is divisible into two quite distinct parts, Upper and Lower Egypt. Upper Egypt conforms to the geometrical definition of a line, it is length without breadth. It runs from the apex of the Nile Delta, roughly the modern Cairo, to the First Cataract at Aswan, a distance of 547 miles. At no point does its breadth exceed twelve miles, and in places it is only a few hundred yards. It should be remembered too that this line which is Egypt is not on the level of the surrounding country, but is sunk in it to a depth of about three hundred feet; some hold that the Nile

itself hollowed out this huge valley, in days when the surrounding deserts still had a heavy rainfall; others that a pre-existing fault or cleft merely served as the line of least resistance for the accumulated waters of the high country farther to the south.

Thus the ancient inhabitant of Upper Egypt lived in a narrow valley, his horizon limited on either side by the limestone cliffs at the top of which lay the desert, a land which played little or no part in his life. Land for him was of two kinds, The Black Land, which was his name for Egypt on account of the dark colour of its soil, and The Red Land, which was his name for the sandy desert. He had no frontiers, the word was meaningless to him, and he had little or no conception of foreign Limited Horizon countries, though the of Upper Egypt hieroglyph with which the word for foreign land is written shows that it was conceived as mountainous in contrast with the level plain of Egypt. Similarly he could not imagine a country which had no Nile; north was for him the direction in which the river flowed, though in reality its direction is in places more nearly east or west. In consequence he regarded Mesopotamia as a country turned upside down, for there the river flowed south; nothing could indicate more clearly than this standpoint the insularity of the ancient Upper Egyptian.

In the Delta, or Lower Egypt, conditions were very different. In this flat triangle of land, comparatively recent in formation, there was scarcely any limit to the outlook, and to its inhabitants it must have appeared as a vast level plain extending to the horizon in all directions, unbroken

by hills or even undulations. Here, though the conditions of labour on the soil were much the same as in Upper Egypt, the broader outlook and the absence of the desert cliffs, giving a sense of freedom in every direction, cannot fail to have produced a different effect upon the mind of the inhabitants. It is therefore the greater misfortune that the slow sinking of the Delta combined with the demands of agriculture have placed most of the ancient sites beyond the reach of excavation. Consequently we cannot estimate, and perhaps we shall never be able to estimate, the part which the Delta played in the development of ancient Egyptian history.

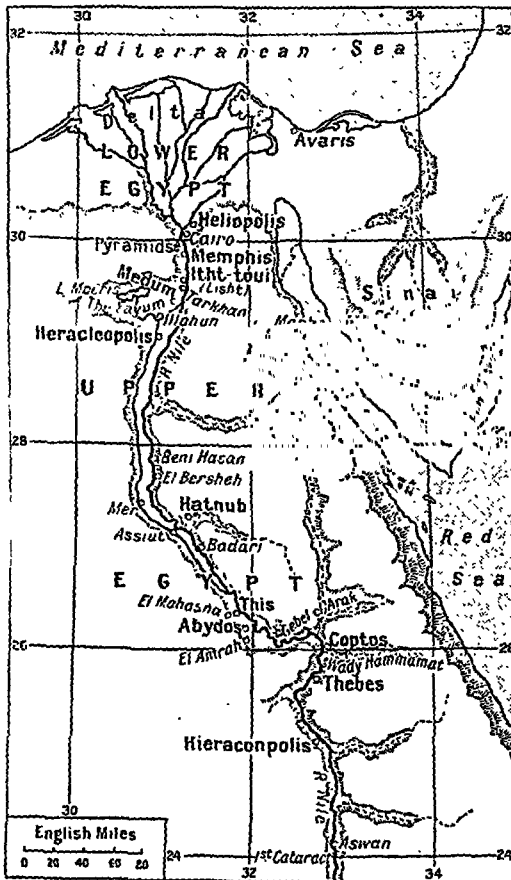
Both parts of Egypt enjoy a good climate. In winter the days are warm—though cold winds spring up occasionally—

and the nights cool. In the Delta rain is not infrequent at this time of year, but Upper Egypt rarely sees rain, and a really heavy downpour only occurs once in about ten years. In summer, say April to October, the whole country is exceedingly hot, though this heat is naturally much more trying at an up-river town like Aswan than it is at Alexandria or even Cairo.

Such are the main physical characteristics of the country. Equally important from the point of view of social development is its geographical position. It guards the entrance to Africa against aggression from Nearer Asia. This latter area seems to have always been a centre of disturbance, and at times of maximum unrest there was a strong tendency for its populations to overflow into the fertile Delta of Egypt. Such invasions of the Delta from the east occurred several times in Egyptian history, on each occasion with results disastrous for the time being. We have even seriously to ask ourselves whether these irruptions were not the reason why Egypt never made any steady progress either socially, educationally or artistically after the era of the Old Kingdom. On each occasion she recovered from the blow, but on each occasion this recovery seems to have cost her energy which might otherwise have gone to the achievement of real advance.

The Delta was hardly more secure on its western frontier than on its eastern, for there lived, without even an intervening strip of desert, the various tribes of the Libyan people who inhabited not only the coastal region but the oases that stretch southward far into the interior of Africa. Some of these Libyan tribes may actually have held the western Delta in predynastic times, and throughout Egyptian history they were ready at the slightest hint of weakness or internal dissension in Egypt to slip back into the fertile lands which they may well have regarded as their ancient inheritance.

From these storms which so often broke over the Delta Upper Egypt was, fortunately, almost immune. She had no neighbours to east or west, and the

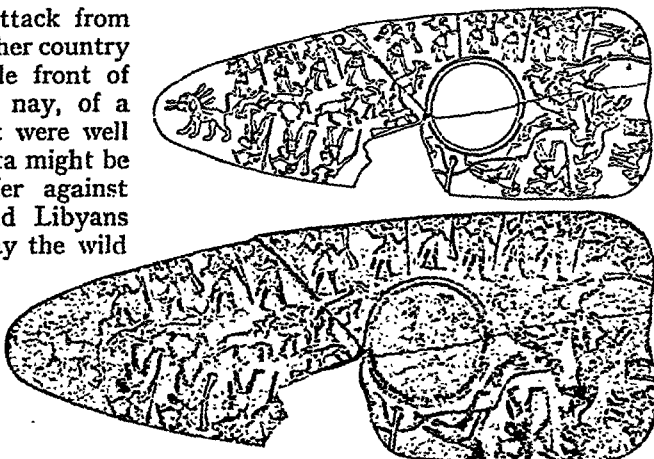


EGYPT'S PROPITIOUS SITUATION

A narrow valley, for the most part, between barren deserts, Egypt was sufficiently isolated to allow of the uninterrupted growth of its peculiar civilization; while the openness of the Delta to attack from east and west prevented the stagnation of complete segregation.

impassable desert precluded attack from either side. To north or south her country could be defended by a battle front of no more than a mile or two, nay, of a few hundred yards if the spot were well chosen. To the north, the Delta might be regarded as forming a buffer against both Asiatics on the east and Libyans on the west. To the south lay the wild tribes of Upper Nubia and the Sudan, who, so far as we at present know, never gave Egypt serious trouble until the time of the conqueror Piankhi in the eighth century B.C.

Conditions in Upper Egypt, therefore, had a stability which was lacking in the Delta. On each occasion on which the Delta fell into foreign hands we find an Upper Egypt unconquered, still carrying on, although sometimes under miserable conditions, the political and social traditions of the past, and ready, when the confidently expected 'saviour' should at last arise, to expel the intruders, to resume her past self and, externally at least, to rise to fresh heights of accomplishment.



SPIRITED IMPRESSION OF A DESERT HUNT

Artistically significant, this slate palette of predynastic Egypt is also of importance in throwing light upon contemporary society. These hunters, we notice, are armed with bows, curved clubs and axes, carry lassoes, and have hounds; they are apparently soldiers organized under two leaders.

British Museum

Our earliest picture of Egypt takes us back well beyond the beginnings of the First Dynasty, and shows us the whole of Upper Egypt and Nubia in the hands of a single race with a homogeneous civilization, the so-called predynastic people. Even since as late as 1925 the veil has been



PEOPLES OF DIFFERENT RACE WHO SOUGHT TO SPOIL THE EGYPTIANS

The inhabitants of early Egypt, or at least of the Delta, seem early to have been obliged to meet the attacks of predatory strangers. Thus, in the somewhat grisly scene carved on a predynastic schist palette, we see defeated warriors of African type dead on the battlefield, and apparently being devoured by birds of prey. On the other hand, the prisoner represented in ivory (left) is distinctly Asiatic; this carving was found in the tomb of King Ka Sen (First Dynasty, c. 3400 B.C.).

From Sir Flinders Petrie, Royal Tombs of Abydos, and British Museum

lifted a little higher and in the settlement and cemetery of Badari we can trace the fortunes of this predynastic race slightly further back. Even when we first meet them they are no longer savages. They are already probably acquainted with copper; they have, as we shall see shortly, their arts and crafts, and, above all, they are agriculturists.

In this last fact lies the key to the understanding of social life in Egypt: it is a system based on agriculture. We do not know where agriculture first arose, or whether it was evolved independently in several areas. It is not even certain that it arose in one of those areas which, like the Nile or Euphrates valleys, seem most suitable to it. We can, however, say that once established in Egypt agriculture and

its attendant practices must have made rapid progress, and immediately begun to react on the character and institutions of the people.

Of the three essential occupations of early man, hunting, pasture and agriculture, the first can never have played a very great part in Egyptian life. It is highly probable, indeed, that in ancient times the desert on either side sheltered more numerous and more various wild animals than it does to-day. A predynastic slate palette shows us an organized expedition against lions, and throughout Egyptian history scenes in the tombs of the great nobles represent their owners as taking part in hunting expeditions in which not only lions but panthers, oryxes and antelopes are pursued and shot with arrows. Yet hunting has become a sport for the great, not a means of livelihood for the people, whose needs in the matter of flesh food, never very great, were easily supplied from domesticated animals and birds. At the same time it would appear that the netting of antelopes and other species of the smaller desert animals, in order to fatten them for the table alongside the more common domesticated animals, was still practised as a means of livelihood.

If the hunting of wild animals had, in the main, become a sport for the leisured, it was not so with the trapping of birds and the netting of fish. The marshes of the Delta must then as now have been the haunt of innumerable wild fowl, which were caught in traps and afterwards fattened for the rich man's table. There are endless representations of this in the tomb-paintings, and portions of traps have actually survived. If in these pictures we see side by side with the netting of birds the great man in his papyrus canoe bringing them



FOWLING AS A NOBLEMAN'S PASTIME

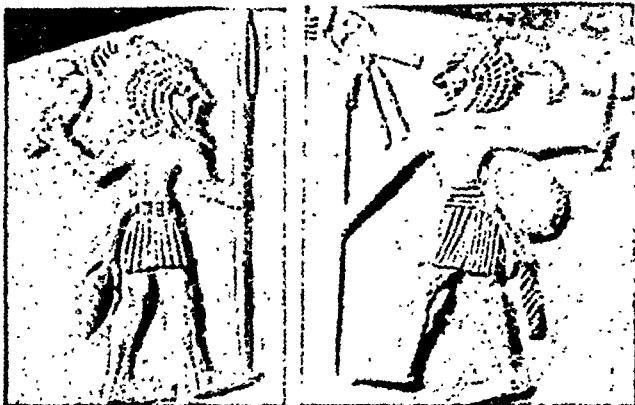
Although not exclusively a sport, as the hunting of wild animals had become even in predynastic times, fowling seems to have been a favourite recreation of the Egyptian nobles. Like this court official of the Sixth Dynasty, they commonly used boomerangs, instead of nets or traps, to capture their prey.

From Blackman, Rock Tombs of Meir (Egypt Exploration Society)

down with his throw-stick, we may be sure that what it represents is a sport and not a profitable method of hunting.

Fish, too, were eagerly pursued, and, unlike flesh and poultry, formed part of the ordinary diet of the common people. The professional fisherman caught them on a hook or with a seine-net, but the great lord amused himself trying to transfix them with a spear, a survival of a method still in vogue in predynastic times, to judge by the early harpoons of bone and of copper which have come down to us.

Thus the early people of Egypt were not in the true sense of the term hunters, and they were not constrained by that necessity of following a moving prey which tends to make a hunting people mobile and unsettled. The lion, the elephant and the hippopotamus might retreat from Upper



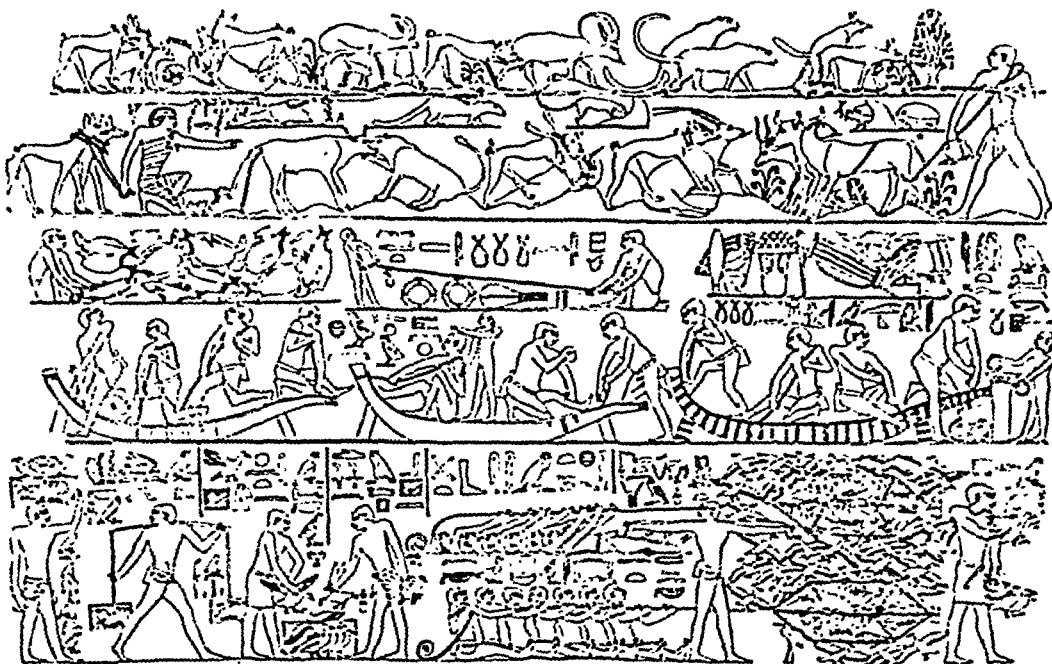
FASHIONS OF PREDYNASTIC DAYS

Points to notice about these predynastic warriors (from the slate palette reproduced in page 483) are their beards and abundant hair and the wearing of an animal's tail, all distinct from historic Egyptian fashions, though the last survived for ritual purposes. The curved club on the left and the tribal standard on the right are also interesting.

British Museum

Egypt to Nubia and thence to the Sudan, but there was no occasion to pursue them.

Anthropologists may dispute as to whether a people ever advances directly from the hunting stage to the agricultural



THE CHASE AS AN IMPORTANT MEANS OF REPLENISHING THE LARDER

Since the peasants regarded fowling and fishing as means of gaining a livelihood, their practice was different from that of the nobles. One sign of this is that they took marsh-birds and fish in nets and traps. The Egyptians were fundamentally conservative in their hunting (above they are coursing), technique of boat-building, fowling and fishing, so that these scenes from a Fifth Dynasty tomb illustrate not only contemporary methods, but also those of a remoter past.

From Tomb of Pisk-Hetep

without passing through the pastoral. The question need not concern us here, for in Egypt in predynastic times we find both pasturage and agriculture firmly established side by side in an interdependent system. For this very reason the Egyptians cannot be considered as a pastoral people in the true sense of the term, nor is Egypt in any sense a land naturally adapted for pasture.

In early times it is possible that agriculture had not yet absorbed the whole country, and that there were still grasslands devoted to

Herding practices in Upper Egypt the cattle. Yet even under the Old Kingdom the shortage of meadow-

land was so serious in Upper Egypt that cattle were regularly sent in charge of their herdsman to the Delta for the summer months, and it may well be that in later Egyptian days the situation had reached the stage which we see to-day, where the domestic animals are not put out to graze but fed entirely on foods specially grown for them.

The Egyptians domesticated few animals for the sole purpose of providing food. The cattle, of course, gave milk, and to the richer classes flesh, but they also formed one of the principal means of transport of the country, being more important in this respect than even the donkey. They were consistently used for ploughing. Sheep provided not only food but also wool, and were further used, as also in later times were swine, for treading in the newly sown seed. Among the other domesticated animals were the goat, the dog—generally the 'slughi' hound, a breed still used in the Sudan—and the ubiquitous cat. The horse is not found until after the Hyksos invasions, with which indeed it may have been introduced, and the camel remained virtually unknown until Greek times.

Among these animals the ox occupied a paramount position, which will readily be appreciated by those who are acquainted with his noble modern descendant, the 'gamûs' or buffalo of Egypt. The ancient breed of cattle seems to have been derived from a domesticated form of the zebu, and in the oldest monuments appears in three forms, long-horned, short-horned and hornless. The greatest care was taken to keep

these varieties of stock pure, and much trouble was devoted to their proper fattening, lumps of dough being crammed down their throats when the supply of more natural foods was judged insufficient. The milkmaid was an unknown figure in Egypt, her work being performed by men.

Side by side with the more familiar domestic animals in paintings of the life of ancient Egypt, we occasionally see a shy gazelle, or an ibex or a bubalis-antelope; these were doubtless luxuries for the tables of the wealthy, and were fattened with dough in the same way as the cattle. There is no evidence that they bred in captivity, and those we see were probably captured in the desert in nets or traps.

The Egyptians can hardly be said to have domesticated any birds. The marshes of the Delta abounded in edible fowl of many kinds, and it was generally judged more economical to capture these in nets as they were needed, and to fatten them for short periods for the table, than to be at the expense of fully domesticating them. It may be added that the domestic fowl was unknown in Egypt until the New Kingdom, when one of the marvels brought back to Egypt from the Syrian expeditions of Thothmes III was a group of 'birds which bring forth (i.e. lay an egg) every day' (see illustration in Chap. 22).

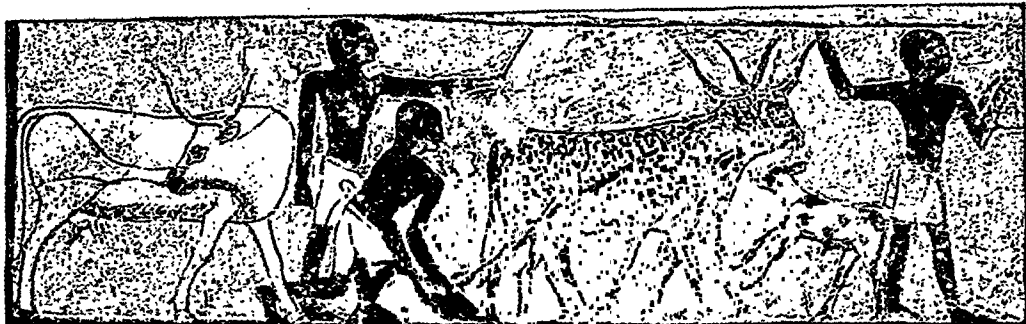
If pasturage occupied a large number of people in ancient Egypt agriculture must have employed still more, at least during certain periods of the year. The Nile, though kind in one sense

to the country which she had created, was unkind in another; kind in the

sense that by her annual overflow she provided a fresh deposit of soil so rich as to make the use of fertilisers of any kind almost unnecessary; unkind in that, having done this, she refused throughout the rest of the year to provide any natural irrigation. Since there was no rain, the prosperity of Egypt depended on the energy of its agriculturists in raising water from the river and directing it through canals and channels into the fields.

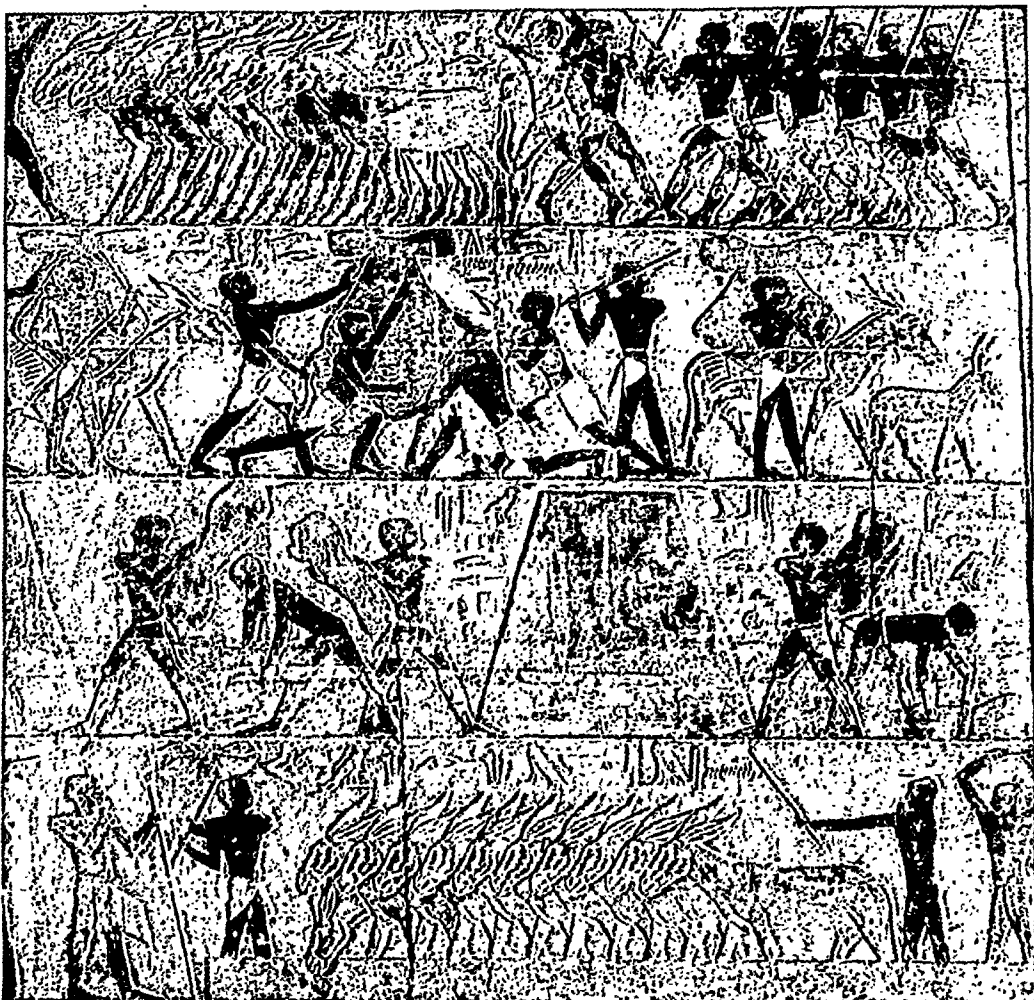
This was done by the same simple means that is most widely employed to-day, the so-called shadûf. On the river bank a long pole is hinged not far from its middle on

Egypt's boon and bane: the Nile



Owing to the fertilising Nile flood, land did not require much attention before the sowing of crops; a light wooden plough sufficed to prepare it. In this vivid study of servants of the vizier Pepi-ankh (Sixth Dynasty) at work, the seeds are apparently being scattered and then ploughed into the soil; usually they were scattered after the plough and trodden in by sheep and pigs.

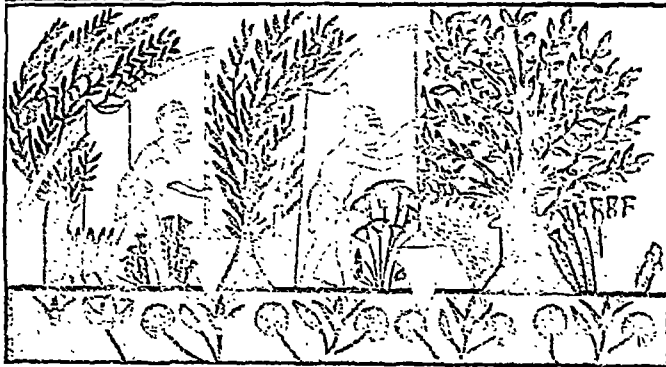
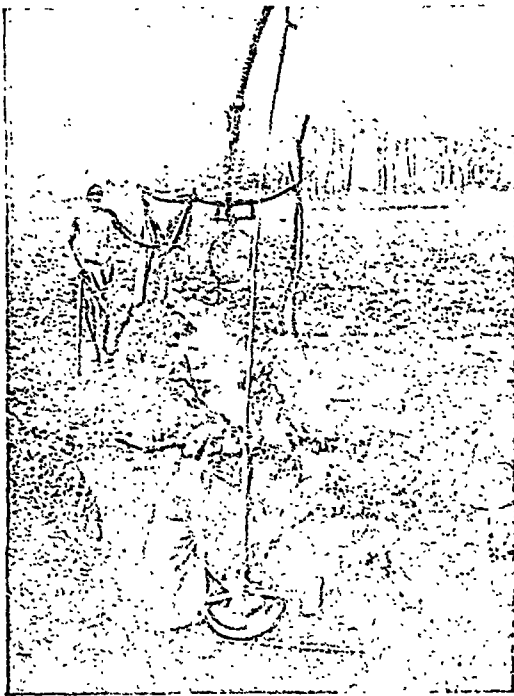
From Blackman, Rock Tombs of Meir (Egypt Exploration Society)



The methods of preparing grain for the mills in the Old Kingdom are admirably illustrated by these reliefs from the tomb of Ti (Fifth Dynasty). In the fields the sheaves were tightly packed into nets and the bundles so formed were carried to the threshing yard by donkeys. Subsequently these animals and oxen were made to tread the corn, to separate the ears from the stalks.

AGRICULTURE AS IT WAS PRACTISED ON THE ESTATES OF THE GREAT NOBLES.

Courtesy of Sir Flinders Petrie



ANCIENT DEVICE FOR RAISING WATER

The shaduf was as necessary to the labourer of ancient Egypt as it is to the fellah of to-day, in enabling him to raise water for irrigation. Modern shadufs are astonishingly like those used by Apui's two servants (c. 1250 B.C.), and we may presume that 1,500 years earlier they were little different.

an upright column, so as to swing like the beam of a scale. From the end nearest to the river hangs a bucket on a short length of rope, while at the other is a stone or ball of mud to form a counterpoise. The worker by means of his own weight pulls down the bucket and dips it into the river. He then allows the counterpoise to raise the full bucket, which he empties into a channel at a level of five or six feet above the river. Three or even four successive shadufs are in many places needed to raise water from the river to the fields.

The chief crops of ancient times were barley (of two kinds), spelt (very similar

to wheat) and flax. The methods of cultivation were simple. So soon as the floods had gone down the land was broken up either by wooden ploughs, drawn in the Old Kingdom by oxen, or by broad-bladed hoes or mattocks of wood. The seed was then scattered and trodden in by sheep, or later by swine. Then followed weeks of daily toil at the shaduf. Finally, when the harvest was ripe, the corn was cut not far below the ears, the straw being apparently left in the ground.

Donkeys bore the cut corn, tied up in short sheaves, to the threshing floor, a round area of beaten mud with a low enclosure wall. Here it was trodden by donkeys or cattle, and finally winnowed by being thrown into the air repeatedly on small wooden winnowing spades, the wind carrying off the chaff, while the grains fell to the ground. The last scene in the process as it is illustrated shows us

the gathering of the corn into sacks and its deposition in round granaries, usually built of mud brick, with domed roofs; the grain is poured in through a small hole at the top, to be withdrawn as needed through a larger door low down in the side. This last process is presided over by the inevitable scribe with his roll of papyrus, recording the amount sack by sack. Both barley and spelt were used for the making of bread and for the brewing of beer.

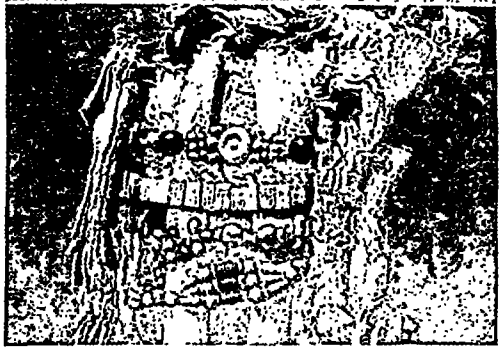
In addition to flax and the cereals other plants were extensively cultivated. Among these were various vegetables, more particularly onions, which then as now were a staple food, and many fruits, more especially dates, grapes and figs. From dates a kind of wine or beer was made. The vine was extensively cultivated, more particularly in the Delta, and inscriptions of almost every period give us the names of the more famous vineyards.

We have described the physical and geographical conditions prevailing in Ancient Egypt, and the pursuits which occupied the minds and the bodies of its inhabitants. It is now time to ask how these conditions and

these employments reacted on the population, what manner of men they became, what kind of polity they evolved and what was their general outlook on life.

The predynastic Egyptian—and here let it be remembered that our evidence comes from Upper Egypt only—was a dark-haired, short and rather delicately built man of so-called Mediterranean stock (see illustration in page 35). In the earliest times he was bearded, but even at the opening of the dynastic period shaving was becoming fashionable, and the later Egyptian was clean-shaven, a relic of his hairy days remaining in the false beard represented as worn by gods and kings, and also by the dead in virtue of their identification with the god Osiris.

The needs of the Egyptian in early days were few and simple. His house was a mere tent of wattle and skins, or other perishable material. His tools and weapons were of chipped flint, and he might count himself lucky did he possess some small ornament of the precious metal copper. His wife's wants were hardly more ambitious than his own. She was more addicted to decking herself out in beads of various materials such as carnelian, steatite and lapis lazuli; she wore ivory hairpins and painted her eyelids with a green pigment made by grinding down malachite on a slate palette, but in other respects she was as simple-minded as her husband. When they died both were buried in shallow



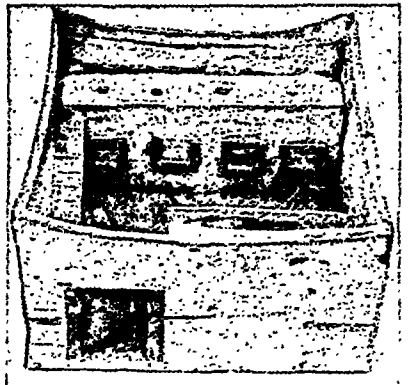
BRACELETS FROM A QUEEN'S ARM

Hidden in a hole in the tomb of King Zer at Abydos, and probably placed there by a robber who never returned, was found an arm wearing the earliest known jewelry, of gold and turquoise and lapis-lazuli beads (enlargement above).

From Petrie, Royal Tombs of Abydos

round or oval pits in the sand, accompanied by some of the objects most dear and most useful to them in life, for it had not occurred to them that in the next life—and they believed in one—their needs could be any different from those of the present.

Two arts, however, the predynastic Egyptian had mastered. One was that of making pottery, the other was the much more astonishing one of covering



HOW THE METHODICAL EGYPTIAN FARMER KEPT HIS GRAIN

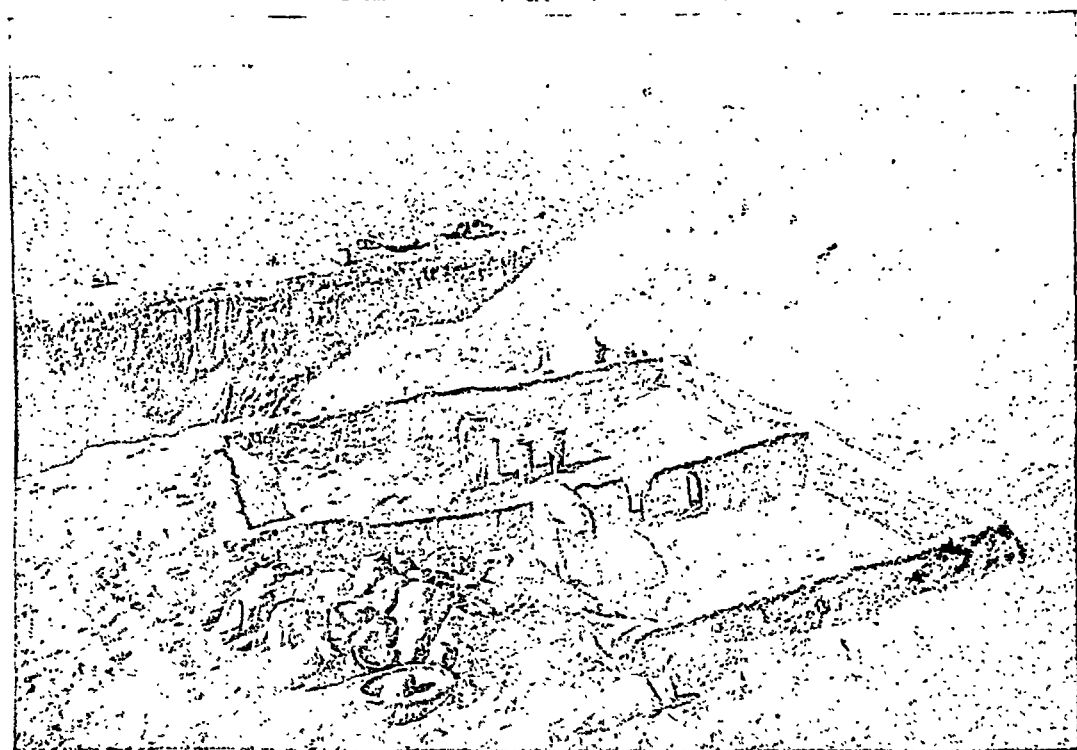
We learn about Egyptian methods of storing grain from funerary models. On the left is a model (First Dynasty) of earthenware jars, surrounded by a low wall. On the right we have a Sixth Dynasty granary with four bins, the name of the appropriate grain being written over each; in front stands the keeper (his head is seen) with his grain measure, while a stairway leads to the roof.

Courtesy of Sir Flinders Petrie and British Museum



The homes of the Egyptian dead show a perfect transition from the simple predynastic pit to the elaborate structures of the Fourth Dynasty. On the left is a shallow oval pit at El Mahasna, containing the corpse in its contracted position with a few funerary vases. In the same cemetery is the later burial on the right, rectangular, brick-lined and equipped with a more plentiful store of offerings.

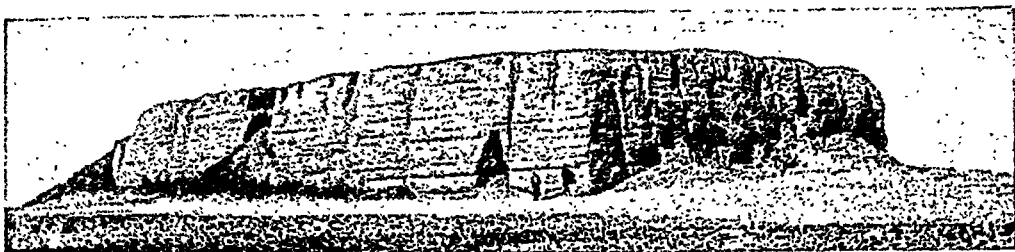
From El Mahasna, Egypt Exploration Society



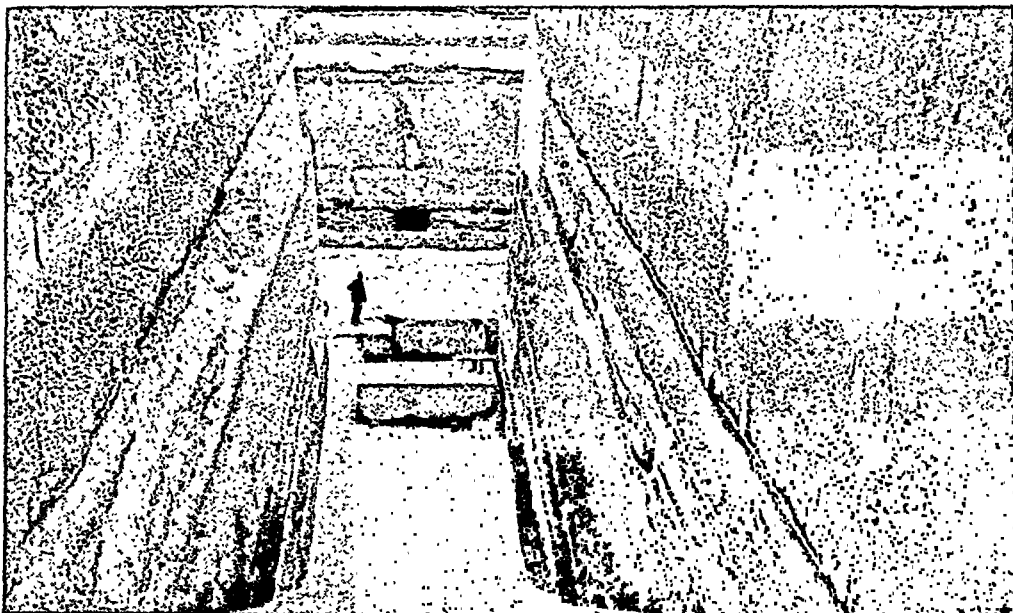
Early graves, such as those at the top of the page, were probably covered with a heap of sand over a roofing of wood, and as time went on the brick lining of the tomb was carried up to contain this heap. At the same time the actual pit was undercut on one side to provide more room at the bottom for equipment. From this grave at Tarkhan the sand has been removed from between the walls; note the small external court, and the slits whereby the dead might enjoy the offerings.

HOW THE HOUSING OF THE EGYPTIAN DEAD WAS ELABORATED

From W. M. F. Petrie, Tarkhan II



The tomb at the bottom of the opposite page is practically the familiar 'mastaba' of the early dynasties ; the roof has only to be cased in brick and the undercutting to become a tomb chamber. Here (top) we see the brick mastaba of King Zeser at Beit Khallaf. Other predynastic tombs entered by a stairway (bottom, at Naga ed-Deir) underwent a development into a type shown in page 503.



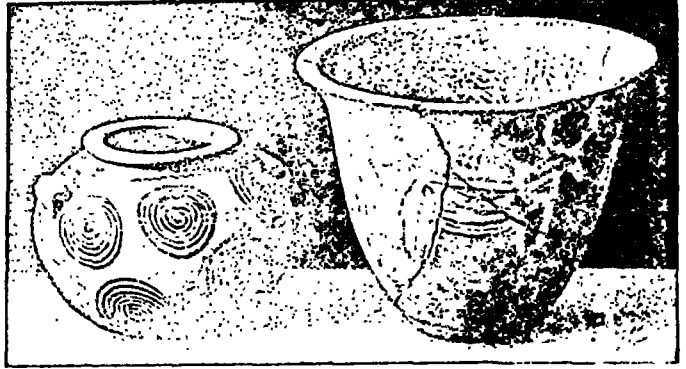
In many mastabas the offering chapel is merely represented by a niche or 'false door' in one side ; other and later ones had it within. In royal burials its place would be taken by a temple adjoining. For these stone came into use long before it was adopted by humbler folk : Zeser had a stone pyramid, shown in page 504, as well as a brick mastaba, while this is the descending passage to the huge unfinished tomb at Zawiyet el-Aryan of a king who is perhaps Neferka of the Third Dynasty.

TOMBS OF KING AND COMMONER : HOW THREE TYPES AROSE

Photos, H. R. Hall (top), Reisner, Naga-ed-der (centre) and Jean Capart (bottom)

various materials with a coloured glaze. The pottery (see illustrations in page 38) was hand-made, and for the artistic perfection of its forms and the delicacy of its polished surface has seldom been surpassed.

As to the length of the predynastic period it is futile to guess. We do, however, know that it witnessed very considerable material and social development. Copper became more and more common until it could be used for weapons and tools as well as for delicate ornaments. With copper perhaps came the use of effective drills which enabled the harder and more attractive stones to be hollowed out into bowls of forms even more exquisite than those of the pottery. The art of flint working underwent a steady improvement, culminating in the production of those beautiful, ripple-flaked knives in the manufacture of which a piece of flint was first roughly shaped by chipping, then ground down to exact



SUPERB CONTOURS OF PREDYNASTIC POTS

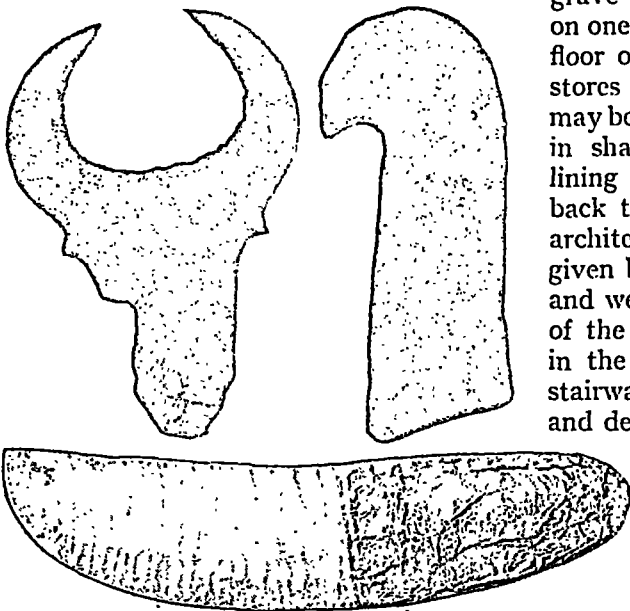
The technical perfection, in shape and finish, of the earliest Egyptian pottery is amazing. Painted animal motives (right) soon replaced the simpler basket-work designs; but the fashion for stonework restricted their development, so that even clay pots were painted to imitate marbled stone (left).

British Museum

form, and completed by the removal by pressure of an even series of parallel flakes and the sharpening of the edge by the most delicate toothing.

With these improvements in craftsmanship went hand in hand a desire for greater material comfort and luxury. Paradoxical as it may seem, this is more evident to us in the tomb than in the house, of which, unfortunately, we know very little. The grave becomes larger, it is even undercut on one side in order to make a more roomy floor on which the now greatly increased stores of food, drink and personal objects may be deposited. It is usually rectangular in shape, and in the introduction of a lining of sun-dried mud bricks to hold back the sand lies, perhaps, the germ of architecture. In some tombs access is given by means of a stairway at one end, and we thus have already the prototypes of the two forms of tomb most frequent in the period of the Old Kingdom; the stairway tomb has only to increase in size and depth, and the old pit tomb has only to enlarge its undercutting until this becomes a regular underground chamber.

But it was in art that the most astonishing advance was made. At first the taste of the predynastic Egyptian displayed itself merely in the production of very rough female figures, or of animals in clay, and in the application to pottery of very



FLINT SUBDUED TO ARTIST'S FANCY

Not only by beautiful ripple-flaked knives, such as this with its handle of gold, is the mastery of the ancient Egyptian over flint attested, but also by the animal heads found in Abydos tombs. The specimens above are a bull and an ostrich.

British Museum and Sir Flinders Petrie

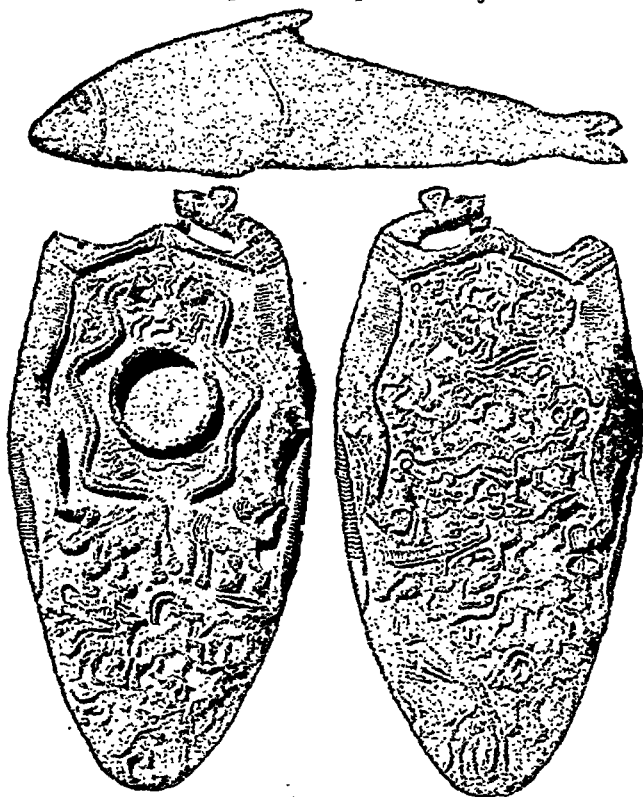
simple designs in colour, or made by incision, mostly copied from basketwork motives. As time went on, however, a more cultivated taste prevailed, and there was a bolder choice of schemes of decoration. The vases with red designs on a buff ground show us plant and animal motives and even ships (compare pages 39 and 463), and had not stone replaced pottery for the making of the finer vases this type of decoration would probably have been even further improved.

As it was, the genius of the artist turned rather to carving in ivory and slate. The simple slate palettes used for grinding eye-paint, and shaped roughly in the old days into the semblance of a fish or a bird, were replaced by magnificent ceremonial pieces in which both faces of the palette were covered with relief work showing groups of animals, battle scenes or a lion hunt. The flint knife was now fitted into an ivory handle delicately carved with rows of animals or, in the case of the recently-found Gebel el-Arak example, with scenes of war and the chase. It is immaterial whether this advanced predynastic art be of Upper or of Lower Egypt, or whether, as some not unreasonably suggest, it show affinities with the early artistic products of Elam. The essential is that it is Egyptian art of the late predynastic period and that it already contains the germ of much that is finest in the products of the best period, the Old Kingdom.

It is lamentable that we do not know more about the structure of society in Egypt in these highly interesting times. All our evidence goes to prove that just before the First Dynasty Egypt consisted of two separate kingdoms, Upper and Lower Egypt, and that these were then forcibly united by a king to whom tradition has given the name Menes, but of whom under that name we can find

no contemporary record. Even as early as the Fifth Dynasty all trace of predynastic history had been lost, and on the Palermo Stone (see page 24) there was nothing more to be entered for that period than some names of kings. Those on the original fragment at Palermo wear the red crown of Lower Egypt, but on the new Cairo fragment of this or a similar stone there are predynastic kings wearing the white crown of Upper Egypt, and at least three wearing the double crown. From this we may infer that there had been a united Egypt even before the time of Menes.

But though written evidence permits us to say no more than this, reasonable conjecture makes it possible to go a little further. In historical times both Lower and Upper Egypt were divided into a number of cantons or nomes, each of which had its nome sign, which, mounted on a pole, was presumably carried as a



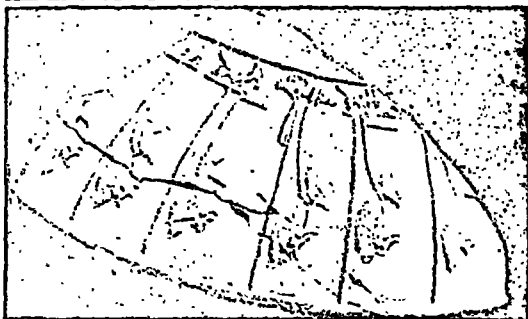
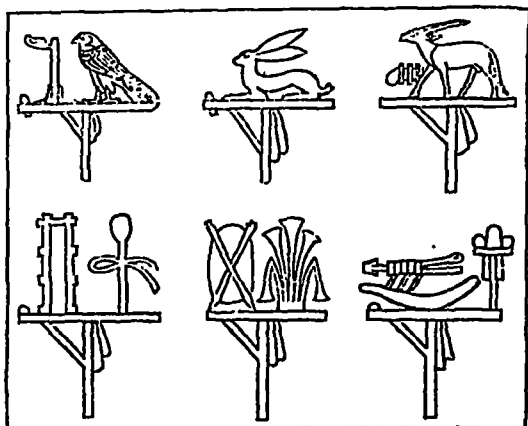
OBJECTS THAT MINISTERED TO VANITY

For grinding eye-paint (an Egyptian social foible) slate palettes were necessary. These were early carved into animal shapes; but later they developed into magnificent ceremonial objects like the one below, back and front, whereon is a riot of beasts mythical and actual. It comes from Hierakonpolis.

British Museum and 'Hierakonpolis' (Egypt Exploration Society)

standard in front of the chieftain. There is some uncertainty about the correct interpretation of these signs, and some of them are undoubtedly simply hieroglyphic spellings of the geographical names of the nomes. Others, however, are certainly not spellings but tribal symbols, and this is especially true of those which consist of animals, such as the hare and the oryx. It has been conjectured with much likelihood that these signs go back in origin to a time when Egypt was inhabited by a number of partly independent tribes whose social organization was that known from modern parallels as totemism, a system in which each tribe allies itself with some species of the animal or vegetable world and uses the figure of its totem as a tribal symbol.

Whether this system still prevailed in Egypt at the time of the earliest archaeological remains yet known to us cannot be said, but it is clear that before the beginning of the First Dynasty the tribes of Upper Egypt had combined to form a kingdom, as also had those of Lower



SYMBOLS OF EGYPTIAN TRIBES

The topmost band of the mace of the 'Scorpion' (see page 497) shows a row of tribal standards, each with a bird, symbolic of some enemy, hanging from it. Above are tracings of some of these 'nome' signs—totemic in origin?—taken from the temple of Seti at Abydos.

From Caulfield, Temple of the Kings at Abydos

Egypt—some ingenious attempts have been made to show traces of this process—and that attempts to unify the two kingdoms had even been made. The true totemic stage, with its social implications, had probably long been left behind, and the chief relic of it was the pantheon of gods in human form with animal heads, as, for example, Thoth the ibis, Sebek the crocodile, Horus the hawk.

The ultimate fusion of the tribes within the areas of Upper and Lower Egypt respectively was manifestly inevitable. The spread of agriculture brought with it the need for settled conditions and the realization of a common interest. The unification of the Upper and Lower Kingdoms, however, was far less inevitable, for each formed a self-contained geographical unit, and it is likely that we are to see here the hand of an individual genius, actuated perhaps by no more lofty motive than blind ambition. Be this as



MEMORIAL OF A NAMELESS KING

The gem of early Egyptian ivory carving is the tiny statuette known as the Ivory King, found at Abydos. He was probably a First Dynasty monarch: his name and exploits are unknown.

British Museum

it may, Menes, whoever may be indicated by this name, united the 'Two Lands,' and the development of a national consciousness was free to begin.

With typical Egyptian love of compromise and established institutions the fiction of a double kingdom was faithfully preserved, more especially in the king's titles and the names of state departments, where it survived until the end of Egyptian history. In reality, however, the fusion was complete and lasting, and except for occasional periods of stress and storm Egypt was one from this time forward.

Archaeologically the establishment of the Single Monarchy seems to mark an immense advance, so immense that it has more than once been suggested that it was due to invasion by a small group of more civilized rulers from abroad. Recent discoveries, however, do not justify this conjecture. If the wealth and luxury of the tombs of the First Dynasty kings at Abydos form a great contrast with the modest contents of the predynastic tombs immediately preceding them, it must be remembered that these latter are the graves of comparatively humble persons, and that the graves of the predynastic kings have so far escaped our researches. The same fact may explain why writing seems to make a sudden appearance in the First Dynasty in a form far from primitive. If we confine ourselves to one type of tomb we see at once that the transition from the predynastic to the dynastic is perfectly smooth and gradual, and, what is more, the finer artistic products of the late predynastic period, such as the mace head of the Scorpion King, the slate palette of Narmer and the Gebel el-Arak knife handle, make it clear that the art of the First Dynasty was the fruit of a gradual and an indigenous growth.

Once the monarchy was established social and political institutions must be largely dependent on the line of development which it followed. The Egyptian king was at the outset simply a glorified local chief. The tribal chief had been ruler, high priest and law-giver to his tribe. In the process of fusion by conquest or consent which transformed tribal Egypt into a monarchy the functions of the chief must necessarily have increased so rapidly that he was forced to depute some of them at least. In theory he remained the high priest of every god. In temple scenes he still figured as the officiant in all important ceremonies. But as he could not be in two places at once it is clear that he must have been replaced by priests, and so we find that even under the Old Kingdom a professional priesthood was already in being.

As early as the Fourth Dynasty the monarch elected vizier to help him, probably in judicial as well as in administrative matters. Under the Fourth Dynasty this official was the king's son, but in later



CROWNS OF THE TWO EGYPTS

The union of the Two Kingdoms, Upper and Lower, was symbolised by the union of the two crowns. But the fiction of duality was always preserved; and here King Semerkhet appears on the same relief wearing the conical white linen crown of Upper Egypt and the red head-dress of the Delta.

From Sir Flinders Petrie, *Researches in Sinai*

times he was chosen from some other family. At the same time, though the king was compelled to depute and distribute his functions, he remained none the less an absolute monarch.

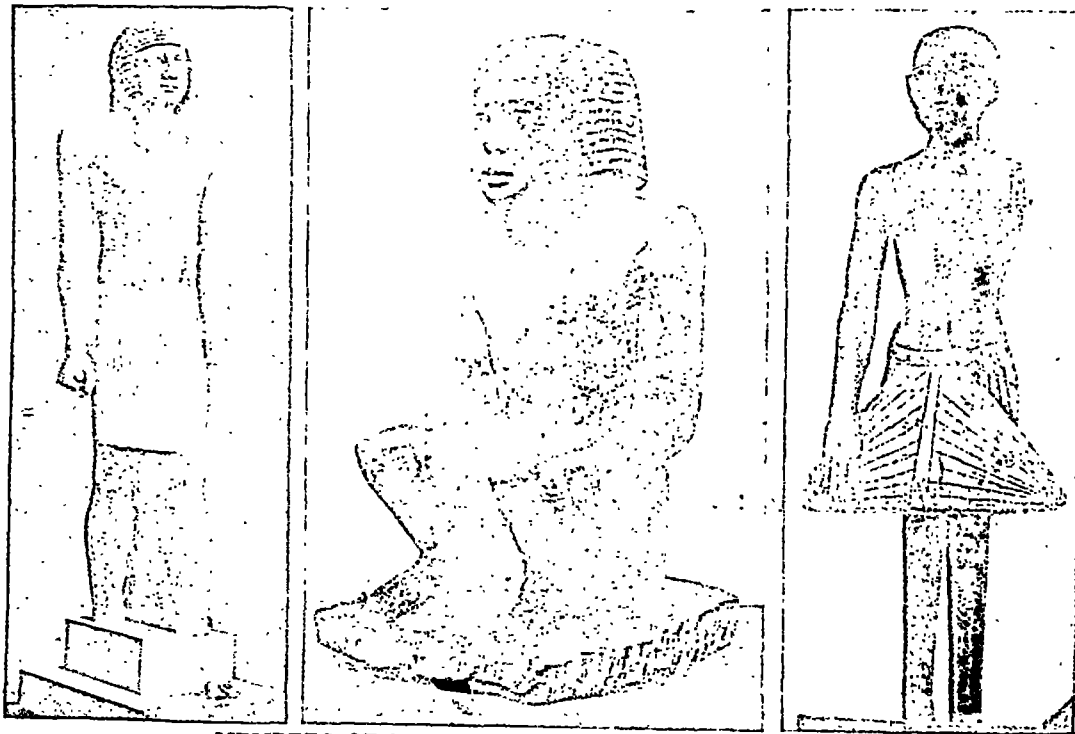
Of the history of the monarchy under the first three dynasties we know nothing, for we have no written records. Under the Fourth to Sixth Dynasties there is more material, and we can partially reconstruct the picture. At the same time, it should be remembered that our material very largely consists of titles, and that these can be misleading, the more so since they were so lavishly showered on Pharaoh's favourites that the holders of genuine offices frequently added the epithet 'real' to their title by way of distinction.

The scheme of government involved a number of local administrations controlled by a central government, at the head of which stood the king himself. The unit of local government was generally the nome, and at the head of the nome was the nomarch, who was governor, judge and administrator of his nome, and,

at the same time, high priest of the local deity. Within his area the nomarch must have enjoyed great freedom.

He was, however, responsible to the royal government for the taxes of his nome, and in the administration of justice he was in some way responsible to the central authority, which was probably vested in the vizier, though this is a point on which we have little evidence. This division into local areas is presumed to have been a relic of the ancient tribal division of Egypt. The succession to the nomarchate was in fact hereditary, though it needed the king's approval, for in theory all the land of Egypt was his.

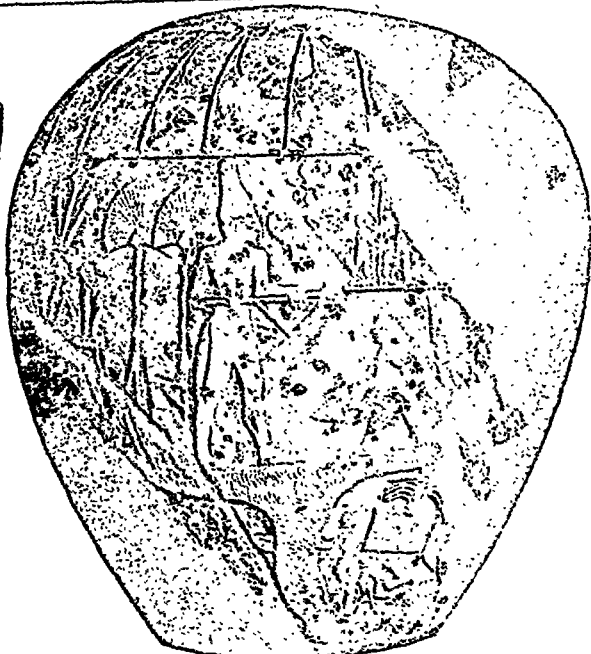
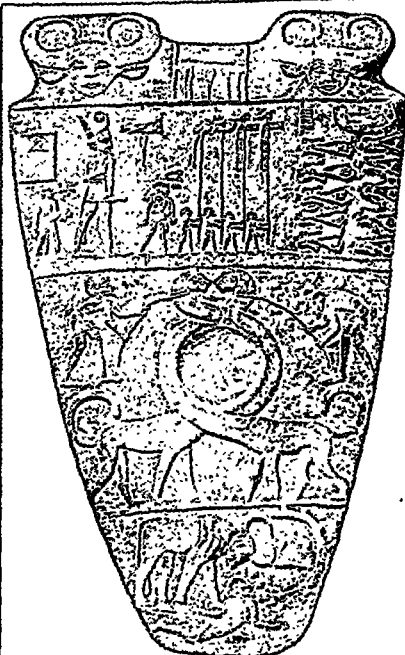
Of the central government we know almost less than of the local. At its head stood the king, assisted by his vizier and a host of other officials. The treasury seems to have been represented by the House of Silver (a name perhaps dating from a time when silver was more valuable than gold) and the Double Granary: we read of Treasurers of the God (i.e. the king), Treasurers of the King of Lower



MEMBERS OF PHARAOH'S EFFICIENT CIVIL SERVICE

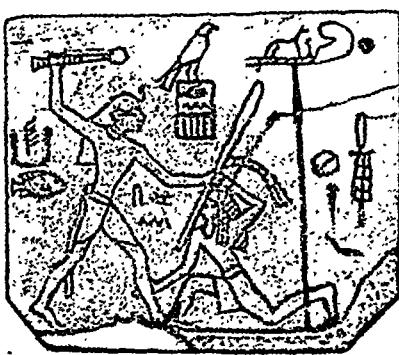
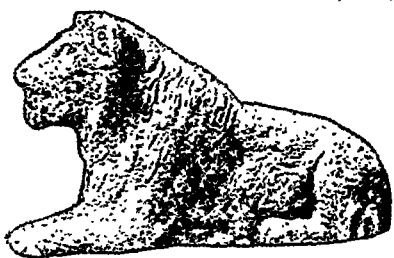
The unification of the two kingdoms and the suppression of local chieftains must have thrown a considerable burden on the central government. From the Fourth Dynasty we find an army of bureaucratic officials many of whose statues survive. Left are Ankheftka and Nefer-hi, scribes under the Fourth Dynasty; right, a wooden statue of a highly-placed minister under the Sixth.

British Museum



Of Egyptian proficiency in carving stone bowls examples have already been given in pages 38 and 462; here are examples of decorative relief in the same material. Left, the great slate palette of Narmer; right, the ceremonial mace of the 'Scorpion' (from Hierakonpolis) showing him holding hoe in hand, to symbolise his public works or the opening of the agricultural year.

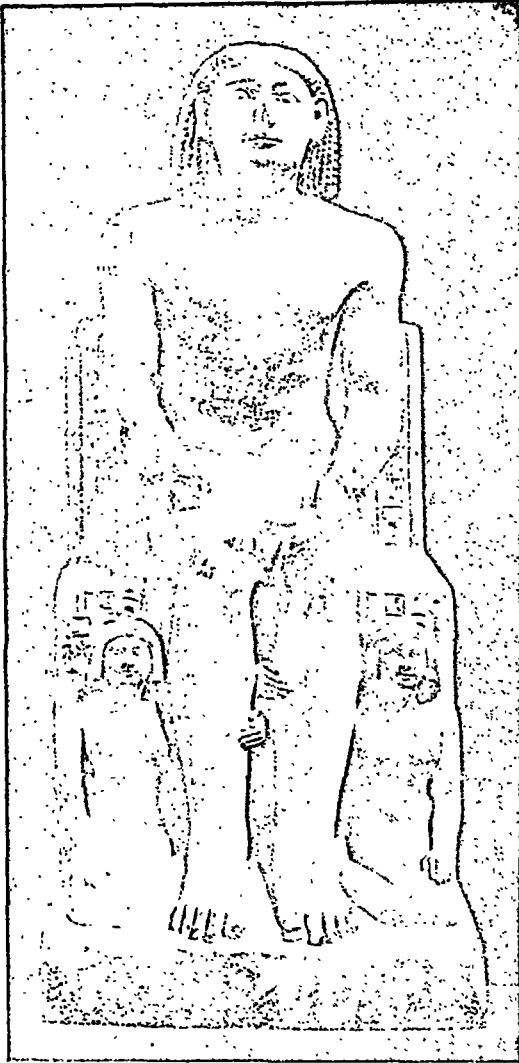
From Quibell, Hierakonpolis and Ashmolean Museum



Vase painting has a meagre history in Egypt; after early experiments of great promise his exceptional skill tempted the artist into more difficult fields, such as carving in ivory and stone. These are examples of the former; an ivory lion; a label showing King Den Semti smiting an Asiatic with a mace (see also further reference in page 559); and the two sides of the famous Gebel el-Arak knife handle, of which details have been reproduced in pages 36 and 39.

British Museum and the Louvre

MASTERPIECES OF THE EGYPTIAN CARVER IN STONE AND IVORY



OFFICIAL AND HIS FAMILY

This funerary group from Sakkara, of an official with his wife and daughter, leaves no doubt that if ever matriarchy was a feature of Egyptian life the husband had successfully asserted his priority by Old Kingdom times.

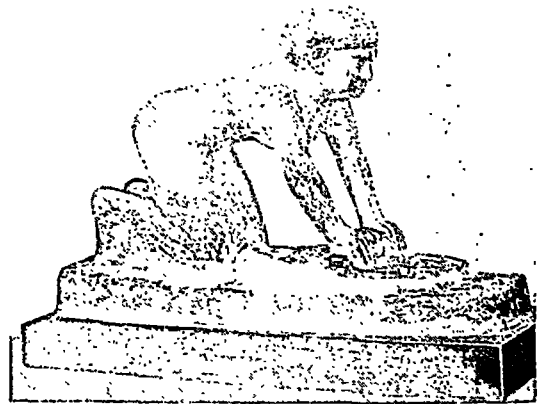
British Museum

Egypt (doubtless an old title which survived the unification of the two lands), and Superintendents of the House of Silver and of the Granaries. Of the central control of the administration of justice we know virtually nothing, and it is not even agreed whether certain titles indicate that their holders performed judicial functions or not.

The strength and the weakness of this system of government are easy to point out. So long as a ruling Pharaoh was powerful enough to hold in check the ambition of individual nomarchs the

system was sound, for government in each nome was in the hands of men conversant with local conditions. Under a weak or indifferent king, however, the immense power wielded by these local potentates at once became a danger to the state and threatened it with disruption. To this very cause indeed is generally attributed the break up of the Old Kingdom at the end of the Sixth Dynasty and the consequent invasion of the Delta by Asiatics.

Throughout the period the power of the nomarchs had gradually increased at the expense of the monarchy, and this is indicated in a very curious but unmistakable manner. The elaborate funerary cult of Egypt seems in early days to have been the exclusive privilege of the king. He was the incarnation on earth of Horus the falcon god (he was actually called the God), and each dead king became identified with Osiris, who may originally have been a historic king of Egypt, but who at any rate became the personification of dead kingship. Each king when he died received, in his capacity of an Osiris, the ceremony of burial at the hands of his son and successor, the new incarnation of Horus. The right to mummification may have formed part of this exclusive funerary rite, though of that we cannot be sure. This cult was gradually passed on by the king to his nobles. Certain favourites received the complete funerary equipment, including tomb, sarcophagus and stores of



THE HOUSE-SLAVE'S TASK

There is a homely touch about the Third Dynasty statue of a woman kneeling as she rubs corn on a stone slab; it serves to show the high level reached by sculpture in the round early on in the dynastic period.

British Museum

food as a 'hetep di nisut'—'a boon which the king gives'—until by the end of the Old Kingdom not only nobles but ordinary persons had come to regard it as their due. Obviously the king could no longer personally provide the outfit, but the name remained and became the invariable term for it, thus preserving the fiction of its royal origin. The usurpation of kingly privilege is a clear indication of the direction in which things were moving in Egypt.

We must now pause for a moment to ask how society was constituted under these political conditions. At the head of the state were the king and his court, an immense bureaucracy where titles must have been highly prized, for some individuals possessed as many as thirty or forty, the majority of which were probably quite meaningless. A similar bureaucracy, aping, doubtless, the manners of the court, must have existed in the principal town of each nome. Many of these officials must have had rich holdings of land in their nomes.

Separated from them by a wide gulf were the peasants, working as serfs on the farms of the landowners, ploughing and watering the land or tending the cattle



RETINUE OF A NOBLEMAN

Tables laden with food in preparation for a feast, a harpist and dancing girls are the subjects of this slab from Ur-ari-en-Ptah's tomb (Sixth Dynasty). It was such personal attendants that the Egyptian noble loved to have sculptured, so that we learn nothing of a middle class, though it must have existed.

British Museum

and sheep. Of a middle class in between these we hear nothing. If such existed—and surely the traders, merchants and skilled artisans must have formed such a class—it was not rich enough to boast its own virtues in elaborately painted and sculptured tombs, and too independent to be included among the rows of servants which the nobles who built such tombs loved to figure there. Very difficult to place in the social scale are the minor priests, of whom there must have been very large numbers. They were independent and self-supporting, for they lived on the offerings made in the temples, but of their social standing we know nothing.

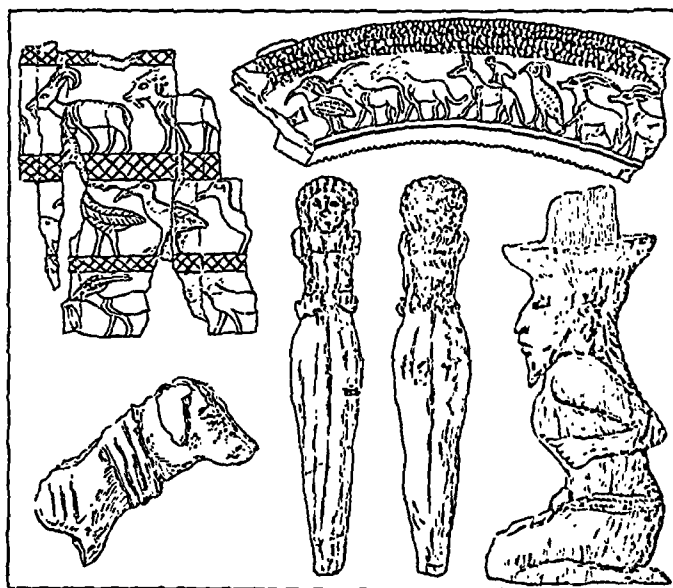
If a generalisation may be permitted with regard to the conditions of life under the Old Kingdom, we should be inclined to say that the nobles and the higher officials were very fortunate and the serfs very unfortunate. These latter seem to have been little more than slaves attached to the great estates, and passed from owner to owner as part and parcel of the land.



AN EGYPTIAN'S PASTIME

A model gaming table of mud, with its movable pieces, from an early grave at El Mahasna, gives us a glimpse of the lighter side of Egyptian life. At all periods some game played with pieces like draughts was a favourite relaxation.

Courtesy of Egypt Exploration Society



WORK OF THE PREDYNASTIC IVORY CARVER

The already high level of artistic excellence from which the history of dynastic sculpture in the round started is revealed by these ivory carvings dating from the last days of the predynastic period. They were discovered at Hierakonpolis.

From Quibell, Hierakonpolis

As against their owners they had probably no rights, and the punishment for even small faults was a merciless beating. But, what was worse, they had two sets of masters. There is a long period in the Egyptian year when the inundation makes work in the fields impossible, and the peasant of to-day retires into his village, and, to use his own phrase, 'goes to sleep.' His fellows under the Old Kingdom had no such good fortune. During the months of agricultural activity Pharaoh's quarrymen had been busy cutting huge blocks of limestone in the quarries opposite Memphis. No sooner had the flood season come than the whole labour of the land was organized under government officials for the transport of this stone over the flooded fields, and its embodiment in the royal pyramid. This was a task which had no end. The king's first thought on ascending the throne was for his burial-place. If it were complete before he was ready to occupy it he revised and enlarged its plan or proceeded to its lavish adornment. When he died there was the pyramid of his successor to be built.

We wonder what the modern economist would say to this annual corvée, in which the whole available labour of a country

was employed for several months on a purely unprofitable piece of work. May we not see in this improvidence one of the causes which arrested the development of social institutions in Egypt, and enabled her to achieve without progressing?

Along with an improvement in material conditions went an artistic development. We have seen that the seeds of this were sown in early predynastic times, and before the beginning of the dynastic age it was already a healthy plant. In decorative relief sculpture a very high level had been reached in the ivory knife handles and slate palettes, and a great advance in sculpture in the round had been made since the crude Min statues from Coptos were

shaped, if we are right in assigning to the predynastic era some of the beautiful ivory figurines found at Hierakonpolis.

The Narmer palette, too, dating from the beginning of the First Dynasty, shows us many of the conventions of later Egyptian art already in being. This delicate low relief, well suited to a country of bright sunlight and sharp shadows, was destined to have a long and successful history in Egypt. We can hardly claim to be able to trace its evolution during the first three dynasties, since examples are few and far between, though the grave stela of King Za, or Zet, and many smaller pieces of work from the royal tombs of Abydos show a steady advance in the first two dynasties, more especially in technique and mastery of material. From such examples we pass abruptly to the finest sculptured tombs of the Fifth and Sixth Dynasties, such as those of Ti and Gernikai at Sakkara. Here we have Egyptian art at its highest development.

In the drawing of this period there is much that is conventional, much that is incorrect even, yet this is more than atoned for by the supreme quality of 'line,' that quality which draws the eye gently on from one curve to another by easy

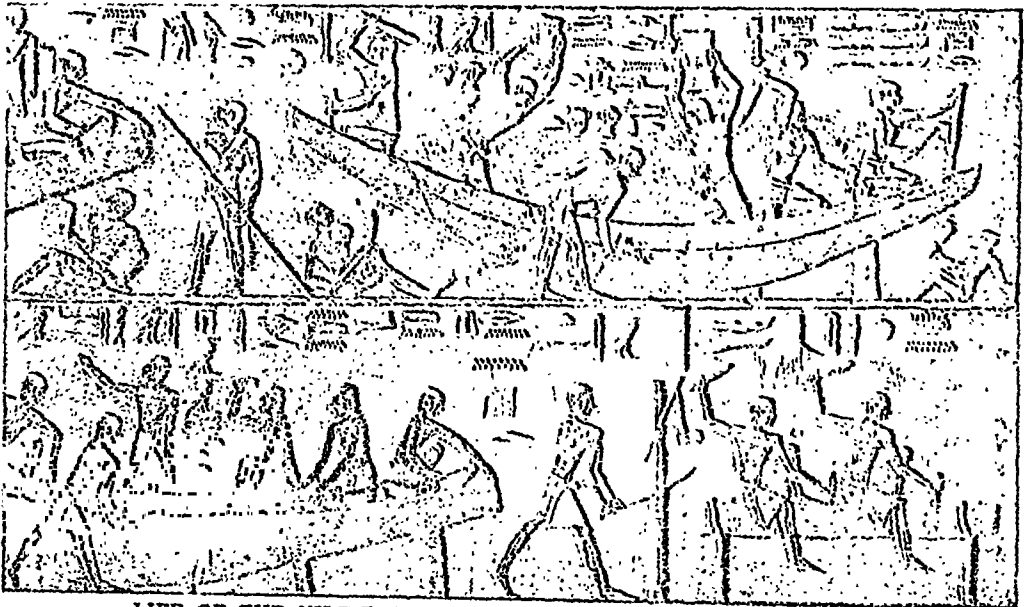
transitions and without shock or effort. Here we are reminded of the best Chinese and Japanese work. The decorative value of Egyptian relief lies, so far as it is analysable, partly in the recognition of the effectiveness of certain details in and for themselves, still more in the admirable adaptation of the subject to the space to be filled. Given a piece of wall to be decorated no artist will fill it for you more satisfactorily than the Egyptian.

Yet these successes were achieved in the teeth of the most cramping conventions. Perspective is almost wanting in the drawings and carvings of this era; an object which is to be represented as behind another is merely placed over the top of it. The human figure was always shown in profile, though the shoulders were represented as if seen from the front, since it was thought that this was the most characteristic view of them. The difficulty of such a combination and the absurdities to which it must lead can easily be imagined. And yet in spite of it the reliefs on wooden panels from the tomb of Hesi of the Third Dynasty rank among the most perfect pieces of art in the world. They have that 'air of infinite suggestive-

ness' which does not depend on perfection of form, and sometimes even tends to disappear when this has been achieved.

The standing human figure is, according to the strict convention, shown moving across from left to right of the spectator, the left foot foremost. The left hand, which is advanced, holds a long walking staff and the right, which is retired, grasps in a horizontal position a sceptre which naturally crosses in front of the body. When this position is reversed, as it sometimes is, and the figure is made to move from right to left, this sceptre is often shown passing behind the body, though being now held in the left hand it ought still to be in front. Here the artist in his mechanical attempt to reverse the perspective has been led into an absurdity. Nothing could show more clearly the limitations by which the Egyptian hampered himself, and yet such limitations do not preclude an artistic result.

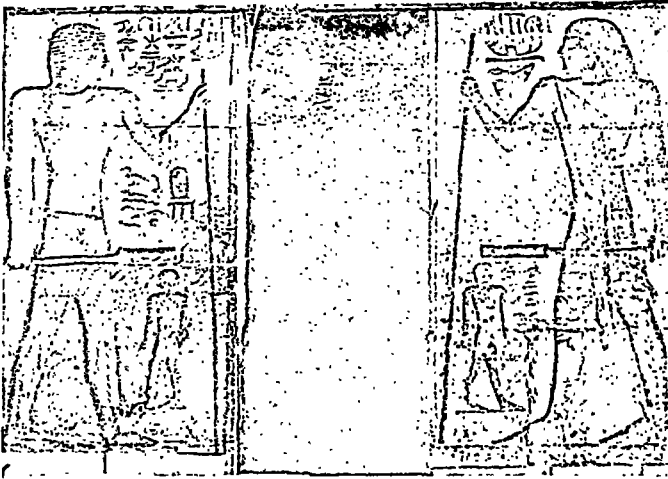
Sculpture in the round did not fail to keep pace with relief, and in the Fourth to Sixth Dynasties Egypt produced more great statues than in the whole of her subsequent history. Yet statuary owed its origin to a religious and not to an



LIFE OF THE NILE-FARERS ADMIRABLY MODELLED IN RELIEF

The admirable decorative effect of the characteristic low relief developed by Egyptian tomb decorators is well shown by these scenes in the tomb of Ti at Sakkara. They depict the operations of boat building; craftsmen with adzes, hammers and chisels are fashioning dug-outs on lines perpetuating the shape of the old reed-bundle float. Note the method of sawing a plank below.

Cairo Museum



UNNATURAL ARTISTIC CONVENTIONS

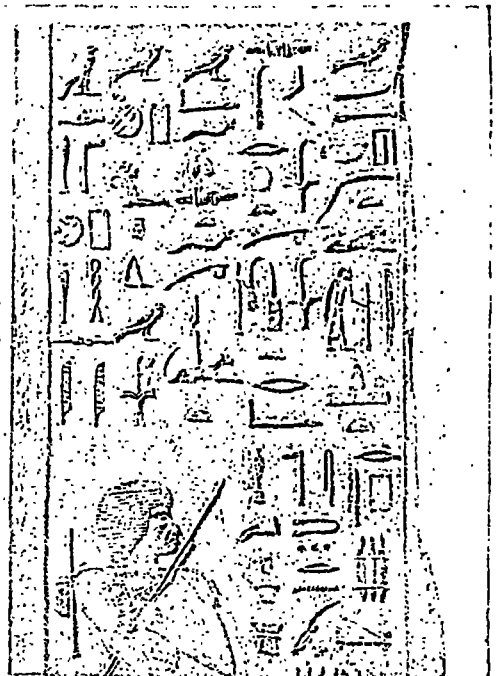
Confusion beset the Egyptian artist when reversing an upright figure, normally shown moving from left to right. Staff and sceptre change hands for the sake of balance; yet, from a feeling that this is wrong, the sceptre sometimes appears on the far side of the body! Here (right) it is on the near side, but for the same reason the hands are shown back to front.

Berlin Museum

artistic impulse. The Egyptians believed that after death a man continued to live in his tomb in some physical sense not very different from the present life. He there-

fore needed a physical body. Hence the necessity for mummification. Experience, however, showed that mummies often went to pieces, and, as an insurance against this, portrait-statues of the dead man were placed in the tomb in the hopes that they might take the place of the mummy.

To this curiously crude belief we owe some of the finest portrait statues the world has produced. Some are of wood, most of stone, rarely of the hard stones like diorite and granite, though the Egyptian craftsman had no dread of these, usually of painted limestone. Let those interested in art take the following group of statues (see pages 473-480): the diorite



WOOD CARVING UNEXCELLED IN ANY AGE OF HISTORY

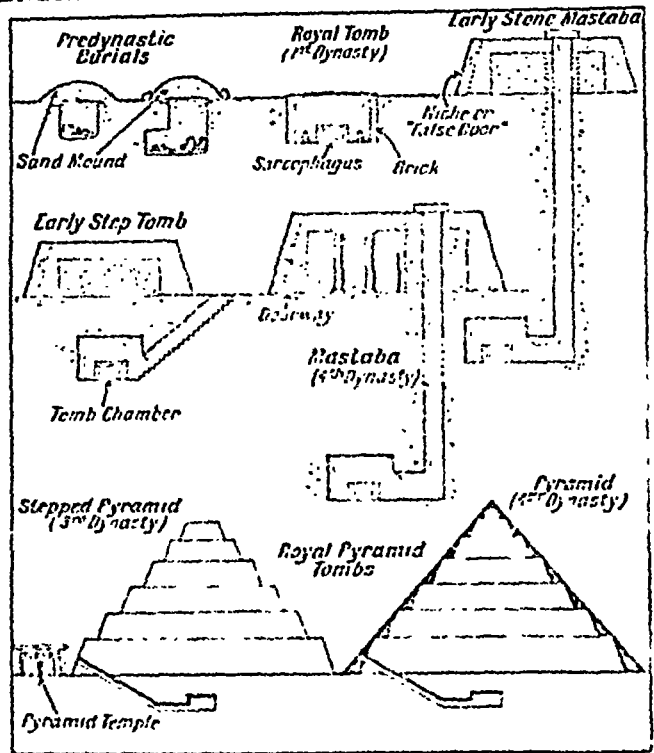
Wood does not seem to have been chosen as often as stone by the Egyptian carver, who delighted in setting himself the hardest tasks—though we must remember that it is more perishable. What does survive in this material from the Old Kingdom is inimitable; nothing could excel the sure characterisation and spare economy of line in these panels from the Third Dynasty tomb of Hesi.

Cairo Museum

figures of Pepi I and Meren-ra, and compare them with a similar group from any country at any period. We believe that as works of art they will at least hold their own. It is certain that no group of statues can be found in later Egypt to approach them in perfection. With the fall of the Sixth Dynasty and the ensuing confusion this art, already on the wane, disappears completely, and when we again meet portrait statues in the Middle Kingdom they have lost that solid brilliance characteristic of this earlier period only to replace it by a hardness and strength which appal rather than please.

The arts seldom develop quite independently, and side by side with sculpture and drawing developed architecture. When predynastic man began to line the sides of his tomb with bricks made of Nile mud dried in the sun, architecture had begun. Perhaps he was already employing such bricks in the building of his primitive house, though planks of wood were early used for this purpose and remained popular in the early dynasties. In the tomb of King Den of the First Dynasty, at Abydos, we find a flooring of granite, while in that of Khasekhemui of the Third Dynasty a whole room is lined with limestone.

This art of building must have made, during the first two dynasties, immense strides, all contemporary traces of which have disappeared, for the recent discoveries at the pyramid of Zeser at Sakkara show a highly developed and technically perfect style of building, which its discoverers describe as marking the end rather than the beginning of an architectural era. Here, to the astonishment of all, have been found engaged columns fluted in the Doric style, anticipating by centuries the earliest examples previously known from the Eleventh to Twelfth Dynasty tombs of Beni Hasan.



GENESIS OF THE PYRAMID TOMB

The illustrations in pages 490-1 traced the evolution of the mastaba tomb; this diagrammatic series shows how the mastaba probably evolved into the pyramid. If this is so the earlier solid mastaba with its niche for offerings was the parent form, not the later type with offering chamber within.

Next in chronological order to these Sakkara remains come the pyramid-temples of the Old Kingdom and the sun-temples at Abusir. And since the architecture of this period is known to us almost exclusively from funerary buildings we must pause for a moment to consider the evolution of the tomb form. We noted above that at the end of the predynastic period the tomb tended to evolve on two separate lines, the stairway tomb and the pit tomb. Both these had a long development under the Old Kingdom.

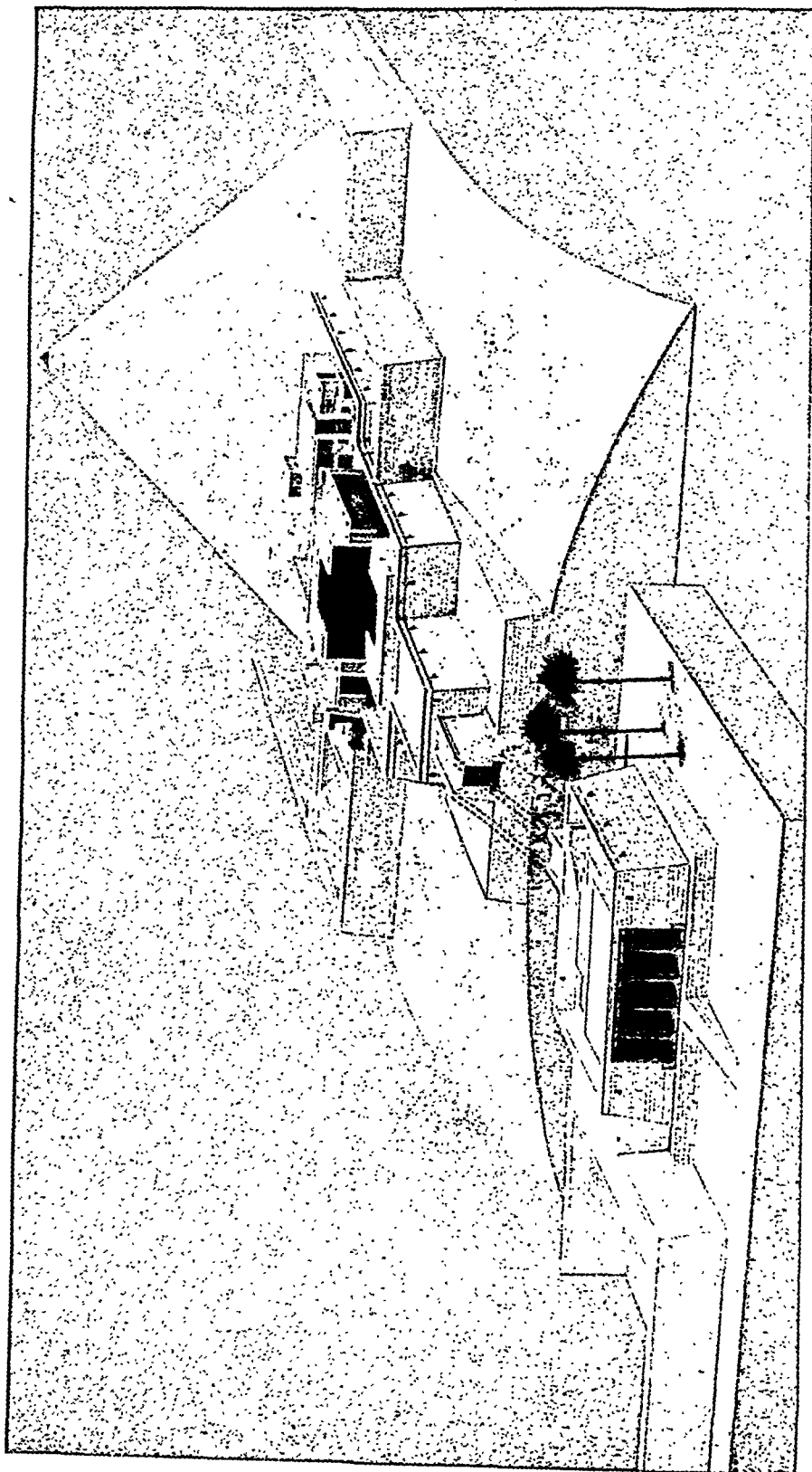
In the first place every Egyptian grave consisted essentially of two parts, the underground burial-place where the body lay, and the offering-place above the ground, where pious relatives placed daily gifts of the food and drink needed by the dead man in order to continue his life in the tomb. It is possible that in some early tombs this upper portion was missing or consisted merely of a heap of sand or a



STILL DEFYING THE RAVAGES OF NEARLY 5,000 YEARS : THE GIZEH PYRAMIDS FROM ALOFT

For the climax of pyramid building one must move on to the Fourth Dynasty, three of whose kings, Khufu, Khafra and Menkaure, built the famous group at Gizeh. In this air view looking westward into the desert that of Khufu or Cheops (the Great Pyramid—see page 509) is the nearest; much the smallest, that of Menkaure in the background is yet a worthy member of the group by reason of its good preservation and perfect proportions. That of Khafra preserves some of its outer casing at the top. The comparatively tiny stepped pyramids are the tombs of royal relatives.

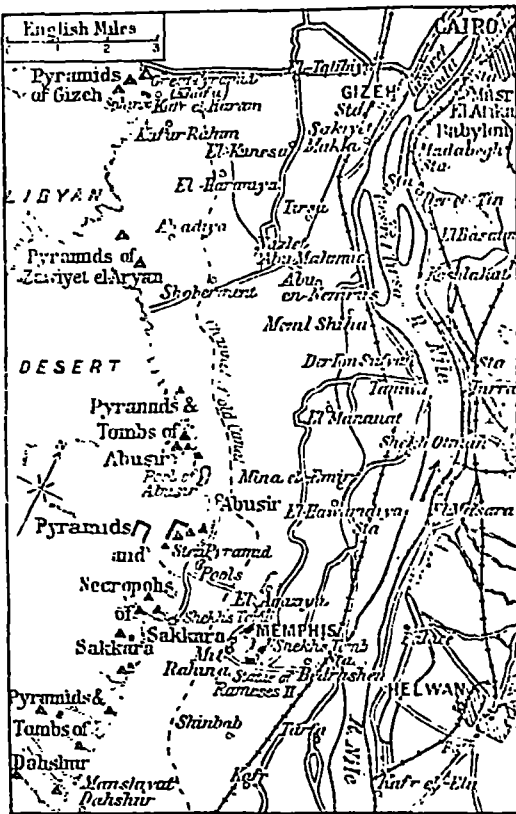
Royal Air Force Official, Crown Copyright



A PYRAMID AND ITS BUILDINGS AS THEY STOOD READY TO RECEIVE THE DEAD PHARAOH

It was the careful excavation of Fifth Dynasty ruins at Abusir that revealed the true relations of a pyramid's component parts ; this is a model reconstruction of the tomb of King Sahu-ra. When the ancient Egyptian came to pay his respects to the dead, he would disembark at the introductory temple on the edge of the flood limit, and after preliminary purifications proceed along a covered passage (here broken and much shortened). At the end of this was the most important part of the complex, the mortuary temple in front of the pyramid, taking the place of the offertory niche in the old mastaba.

Photo, Metropolitan Museum of Art, New York



THE NECROPOLIS OF MEMPHIS

There are pyramids of lesser interest at Thebes and in Nubia, but Egypt's great pyramid field stretches south from Cairo, a necropolis that received the dead of one of the greatest cities of antiquity for 3,000 years.

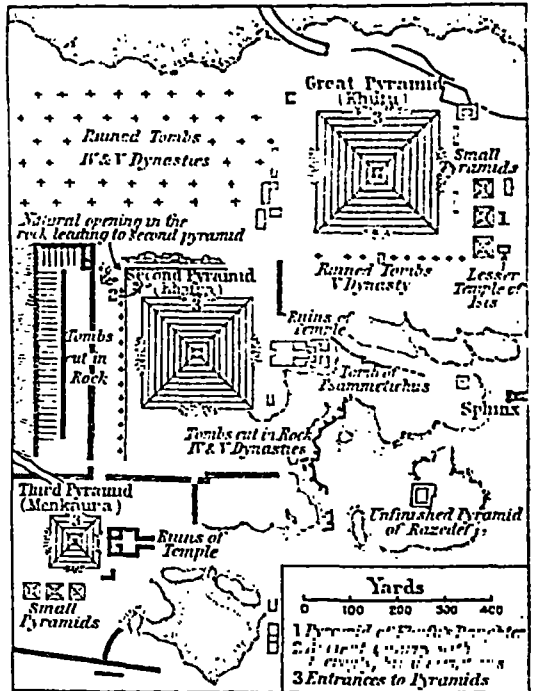
gravestone. As early as the First Dynasty, however, it took the form of a mastaba or small solid rectangular brick structure with a slight batter or slope to its sides, and a niche in one face, in front of which the offerings were laid. By the time of the Fourth Dynasty these simple buildings had developed into the great stone mastabas of the nobles by which the pyramids of the kings of the Fourth Dynasty are surrounded. Beneath the mastaba itself lay the tomb chamber, reached either by a staircase or a vertical pit. In the mastaba were the rooms, simple or elaborate, in which the food and drink offerings were laid.

In the case of the pyramid, however, the arrangements were slightly different. The king, like his nobles, lay in a rock-cut chamber below the surface, and the pyramid, like the mastaba, formed a memorial pile above his tomb. The

offering chambers, however, are not in the pyramid, but built against its east side, and they are so numerous as to deserve the name of a pyramid temple. If the pyramid be a development of a mastaba, as some suppose, it is based on the early solid mastabas, and the temple is the outcome of the original offering niche.

A pyramid and its temple stood on a plateau a hundred feet above the level of the fields. In order to facilitate approach, a covered sloping passage was constructed, leading up from the plain to the temple, and at the lower end of this passage was built a small introductory temple. The so-called Sphinx temple at Gizeh is the introductory temple of the second pyramid, that of Khafra: the Sphinx itself attaches to this same pyramid and is in fact a portrait-statue of Khafra himself.

These early temples exhibit most of the features of later Egyptian religious architecture. They are all solidly constructed and roofed, where roofed at all, with horizontal blocks of stone carried on columns without the use of the arch, though this was not unknown to the



PLAN OF THE GIZEH PYRAMIDS

Behind Khafra's pyramid are some foundations, perhaps of barracks for the workmen who built it. In front is the mortuary temple; and it is now known that the Sphinx is part of the lay-out of the introductory temple.



VASTEST MEMORIAL WITH WHICH MAN HAS EVER MARKED HIS GRAVE

Khufu's great pyramid, mightiest of the trinity at Gizeh, stood originally 481 feet above the plateau, before its capstone disappeared, and is estimated to contain 85,000,000 cubic feet of stone. The smooth outer casing of limestone and granite has long since been pilfered for buildings. Of the Sphinx, belonging to Khafra's pyramid, a view taken after the most recent clearance of sand appears on page 25 ; in front of it are here seen the foundations of the introductory temple.

Photo, Sir Flinders Petrie

Egyptians, as evinced by tombs of the Third Dynasty. Thus we have already in the old Kingdom the two main features of Egyptian temple architecture, the hypostyle hall, that is, the hall completely roofed, the roof being borne on columns distributed over the whole area of the floor, and the colonnaded hall, that is, an open court round one or more of whose sides runs a narrow covered portion with its roof supported by one or two rows of columns rather in the manner of a cloister.

Of religious architecture of this period outside the pyramid temples we know nothing except from the sun temples of the Fifth Dynasty kings at Abusir. The design of these must have resembled closely that of the pyramids, for there was an introductory temple and a sloping covered approach to the temple proper. Instead of the pyramid placed over the site of the underground tomb there stood a much smaller truncated pyramid surmounted by an obelisk, symbol of the sun god.

MESOPOTAMIA'S CITY STATES BEFORE THE RISE OF BABYLON

The Urge of Life in the early Sumerian Towns
along the Banks of the Tigris and Euphrates

By C. LEONARD WOOLLEY

Director of the British Museum and University of Pennsylvania Joint Expedition to
Mesopotamia: Author of *Dead Towns and Living Men*, *Carchemish*, etc.

MESOPOTAMIA has been called the 'Cradle of the Human Race.' That description is not strictly true, for men had lived, and made progress of a sort, ages before the land of Mesopotamia came into being. On the high desert which lies between the Euphrates basin and the rift of the Jordan valley one can pick up the rudely chipped flint weapons of the Old Stone Age; but the river country is of comparatively modern formation, and in it the deepest strata which contain human remains show that its first inhabitants were already familiar with the use of metal. But it is true that Mesopotamia is one of the parts of the earth's surface where we can trace back farthest in time the origins of our own civilization.

The land is indeed the gift of the rivers. Originally a long arm of the sea, an extension of the Persian Gulf, it has been gradually filled up with the silt brought down by the Tigris and Euphrates, the Karun and the now dry Wadi Armak (al Batn); and the nature of the process throws light upon Man's later history in it.

The first stage seems to have been the forming of a bar across the gulf, low down below the mouths of the Karun and Wadi Armak; behind this there would have been a great lake, salt at first but made sweet in time by the passage of the waters from the northern streams. These, their speed checked by the bar across their mouths, the more readily deposited silt in the lake bed and transformed it into a series of marshy lagoons developing into dry land at the northern end; while at the south end the bar, raised by the deposit of the lateral rivers, also became dry land which gradually extended northwards until the two met.

The old gulf had now changed into a vast delta of clay and mud and sand, absolutely stoneless and absolutely flat, through which wound rivers so flush with their banks that they were constantly changing their courses; a delta diversified by marsh and subject to periodic floods, whose light soil could be parched by the summer sun to profitless desert, yet a land which if drained and irrigated could be made one of earth's most fertile places. In the south the palm was native to the soil; wild barley was indigenous, the reeds of the marsh supplied material for habitations, and the vine, the fig and garden vegetables of every kind had but to be planted to prosper: if ever a land called aloud for human occupation it was this.

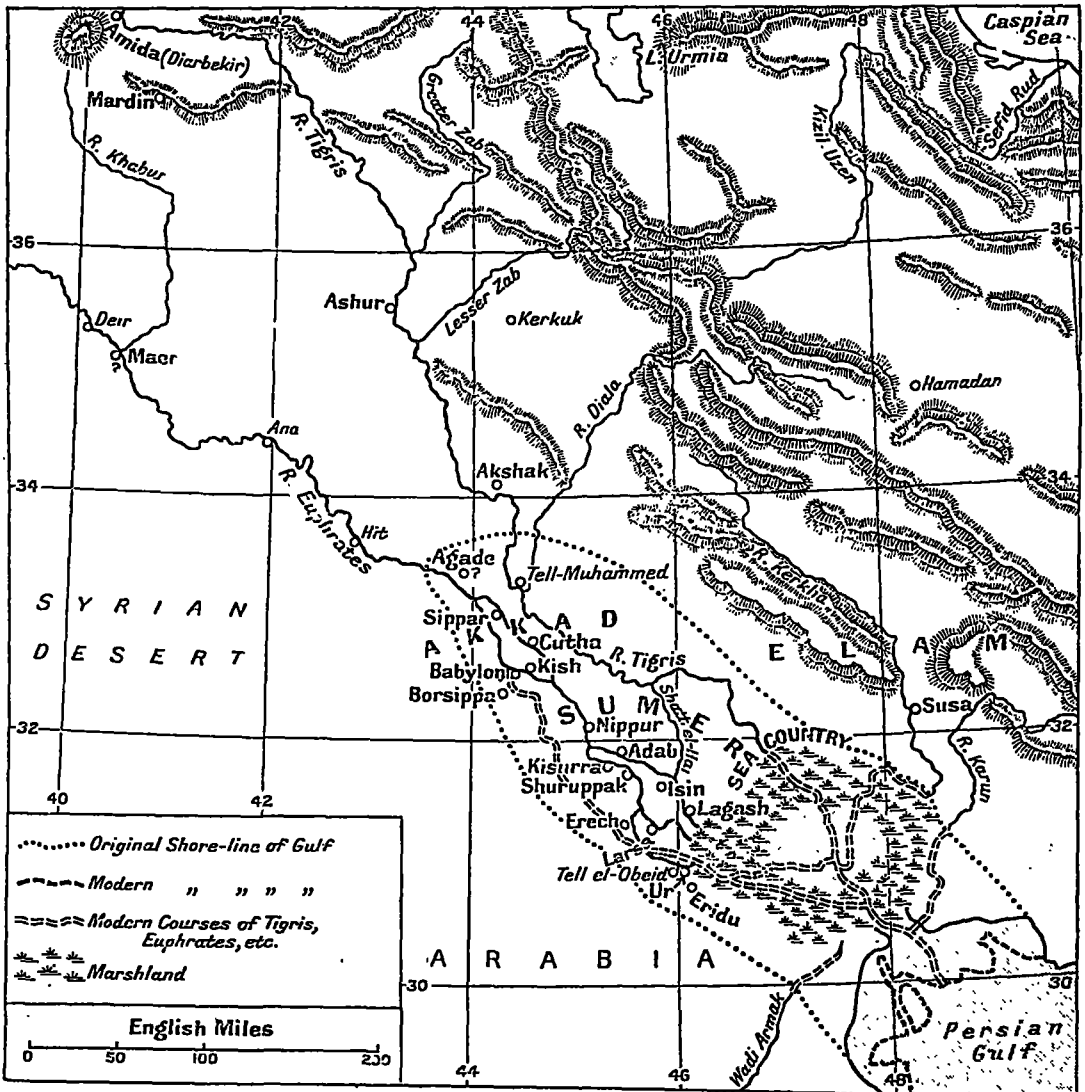
Two races answered the invitation, the Semites and the Sumerians. The southern Semites, the ancestors of the modern Beduin, occupied Arabia and the southern Syrian desert, and as the barrier formed across the river mouths, and the edges of the lagoons dried and gave opportunity for settlement, isolated clans and households of these must have drifted down into the new lands. The northern Semites, a more or less distinct race, more settled and better consolidated, lived along the higher Euphrates reaches and as the northern delta spread and became amenable to cultivation they pushed down into it and entered into possession of the upper half of the valley.

The original home of the Sumerians is unknown: they came from a hill country, somewhere in central Asia, and were so widely spread that kinsfolk of those whom

we find later in Mesopotamia were already settled in the north-west provinces of India. How they came into Mesopotamia we do not know, whether they pushed down through the Elamite hills or came by sea, skirting the eastern shore of the Persian Gulf (as is perhaps more likely, for they were early sea-farers); but in any case they made their way into the lower half of the new valley and occupied it so effectually that the land was called after their name, the land of Sumer.

Thus Mesopotamia was divided into two parts: in the north there was a popu-

lation predominantly Semitic, warlike and aggressive, ever stretching out envious hands to the lower valley yet ever retaining touch with the north and west, with the mountains of Asia Minor and the Syrian reaches of the Euphrates; in the south there was a mixed population in which the Sumerians, with their older and more advanced civilization, naturally took the lead, although, thanks perhaps to the unaccustomed climate of the torrid delta, they were destined in time to lose their vigour and initiative and to merge into, or be replaced by, the Semitic element.



MESOPOTAMIA DURING THE PERIOD OF THE EARLY CITY STATES

The land of Mesopotamia is continuously growing by reason of the silt that its rivers bring down. The dotted line here shows the original extent of the Persian Gulf, while the lagoon area suggests the probable character of the country at the dawn of history, after the southern bar had been formed and the northern delta pushed southward. Our first glimpse reveals two races occupying this delta: Sumerians preponderating in the south (Sumer) and Semites in the north (Akkad).



STONE SOCKETS FROM TEMPLE DOORWAYS

Inscribed with the name of Ur-Engur, 'king of Sumer and Akkad' (c. 2409-2391 B.C.), these door-sockets are from his temples at Ur. They consist of blocks of stone hollowed to receive the butt of a hinge-post; left, the copper 'shoe' of such a post is seen still resting in its socket.

Courtesy of the Joint Expedition to Ur

This racial division accounts for much of the country's subsequent history.

Excavations at Tell el-Obeid near Ur give us a glimpse of one of the early Sumerian settlements. Upon a low mound rising above the level of the flooded land there was planted a village, made up of little huts whose walls were of reed matting stretched between wooden uprights and waterproofed with pitch or a thick mud plaster; their roofs were flat, of mud laid over mats supported by cross-beams, or else arched like those of many modern huts in the district in which bundles of tall reeds tied together serve instead of the wooden uprights, and the tops of each facing pair are bent inwards and lashed together so as to form a series of arches over which matting is laid. The huts had wooden doors whose hinge-poles turned on sockets of imported stone, and the hearths were either holes in the beaten mud floors or were built up with bricks of unbaked mud.

Cows, sheep, goats and pigs were kept, but the horse was unknown; the people grew barley and ground it in rough querns or pounded it to make a kind of porridge. They had copper tools, but these were

luxuries; and small knives and saw-blades, the cutters of the threshing-machines, arrow-heads and so on were chipped out from flint or chert, picked up in the high desert, or from fine obsidian, like bottle-glass, imported from the far-off Caucasus. Indeed, so rare was metal that the sickles for reaping the barley crop were made of baked clay, and because these so easily broke, or grew blunt, and were thrown aside, we find hundreds of them strewn the ancient sites. Bone was used for awls and for net-making, axes were of copper or of polished stone,

and stone was used for food bowls of the better sort.

But the most striking product of these early Sumerians was their pottery. They had not learnt the use of the potter's wheel, but turning the clay by hand they had the skill to fashion vessels of really artistic shapes, admirably regular and sometimes so delicate that they can only be called 'egg-shell ware'; and to decorate them with designs painted in black



BEAUTY OF OLDEST SUMERIAN POTTERY

Although produced without a potter's wheel, the prehistoric painted pottery from Tell el-Obeid (top) is remarkable for its graceful symmetry and the excellence of its substance. The jars and mushroom-shaped table of offerings from Kish, though much later (about 3200 B.C.), are actually inferior in technique.

Photos, C. L. Woolley and Professor Langdon

and red which, though composed of simple elements, are masterpieces of ornament. None of the later pottery of Mesopotamia can be compared for excellence with these earliest vases, and it is from them, through points of similarity with the wares of other lands, that we learn something at least of the cultural relations of their makers.

The villagers went on the marshes in boats with a canoe-like body and high curled prow, and used nets for fishing; they wore garments of

Village life in the southern marsh sheep-skin or of home-spun cloth, and there is some reason to suppose that they tattooed their bodies; their ears were pierced to take studs of stone, bitumen or baked clay, and the women wore heavy necklaces of beads chipped from crystal, carnelian and shell, and dressed their hair in a 'bun' at the back of the head. When they died they were laid in the grave crouched up on one side, knees to chin, with the idea that as a man came forth from his mother's womb so should he go into that other world for which death was a rebirth; for since men placed beside the dead body vessels of food, personal ornaments and tools, the simple things that a man needs in this life, we can understand that they believed in a life to come wherein these would still be required.

We do not know the date of this primitive settlement at el-Obeid, but hundreds of years, perhaps many hundreds, had passed before we next get a view of Sumerian life. Possibly in the meantime Lower Mesopotamia had been overwhelmed by that disaster of which the Flood story preserves the memory; certainly from one cause or another the civilization of the land had undergone a radical change. But whether growth was continuous or interrupted it had produced a rare flower. In graves at Ur, dating from about 3500 B.C., we find art treasures in gold and silver, copper and shell, which not only bear witness to the wealth and prosperity of the period, but prove that civilization properly so called developed earlier in the Euphrates valley than on the banks of the Nile.

The date 3400 B.C. is, roughly, that of the founding of the First Dynasty of kings

in Egypt, a dynasty which introduced into the land what we know as Egyptian civilization and was regarded by the Egyptians themselves as marking the beginning of their history. The contemporary graves of Ur come towards the close of a period reckoned by Sumerian historians as starting at the Flood and lasting for thousands of years. Their records were but vague, mere lists of half-remembered kings (that is natural enough considering when they wrote; how much do we know to-day of British history before the Roman invasion?), but they must be credited with some spice of truth; and when we see the technical perfection of such a thing as the golden dagger of Ur we are compelled to recognize that behind it there lie indeed many centuries of experiment and endeavour.

To illustrate a somewhat later phase of the same early period we have, instead of the peasants' hut of the prehistoric settlement, a king's palace and a goddess's temple. Of the two, the palace, discovered at Kish near Babylon, is the older, though again we cannot exactly reckon its age in years; the temple was built by King A-anni-padda of Ur probably about 3100 B.C. Kish was accounted by the historians of Babylon the first in order of time, as Ur was the third, of the great royal cities, and the title implies a change in the life of the country.

Though the settlement of the land took place, in all probability, by slow degrees, as small bands of adventurers pushed ahead into the drying marsh and perched their isolated huts or tiny hamlets on any island site that afforded safety from the floods, driven to a solitary life by the need for each squatter to cultivate his own patch of soil, yet the Sumerian seems to have been pre-eminently a town dweller. To-day the whole Mesopotamian valley is strewn with 'tells,' the grave-mounds of dead cities. From the outset the process to which these mounds bear witness must have been at work; as conditions grew more favourable the settlers, rather than live lonely on the land, grouped themselves in villages, and the villages developed into towns.

Growth of the earliest cities



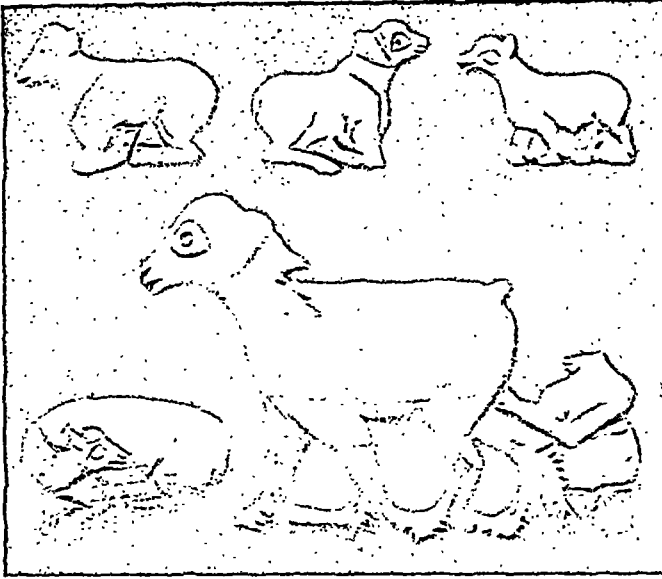
Among the most ancient of Mesopotamian cities—perhaps the most ancient of which records remain—Kish was the seat of kings who were overlords of Akkad and Sumer before the rise of Erech or Ur. That they were cultured and wealthy is proved by the very extensive ruins of their palace (built 3200 B.C. ?) and the richness of its surviving decorations. Note the bases of three pillars that formed part of a colonnade, and the flight of steps leading up to the platform.



For all its impressiveness and grandeur, the royal palace at Kish is constructed of mud throughout; it is raised upon an elaborately prepared, artificial platform. The fact that so much of the building remains shows the great durability of the material and the skill and intelligence of the ancient architects. Some idea of the Sumerian method of laying mud bricks and welding them compactly together with plastic mud is given by this section of very solid wall.

RUINS THAT TESTIFY TO AN ANCIENT BABYLONIAN KING'S MAGNIFICENCE

Photos, P. Hayward



QUAINT CARVINGS FROM A PALACE WALL

Vivid and highly decorative, these varied figures of goats, kids and their herd give an indication of the genius of Sumerian artists. They are exquisitely carved and are inlaid in a plaque that once adorned the palace walls at Kish—one of a series in which similar pastoral subjects and martial events were treated.

Courtesy of Professor Langdon

After all, life cannot have been very secure in a new country where every individual and every community was consumed with land-hunger, when it was quicker to raid your neighbour's cattle than to breed your own, when the larger flocks needed wider pasturage and all the pasturage had been taken up already, and when every newly dug canal was a prize coveted by the community next door; there was safety in numbers, so the town was better than the hamlet. Experience had taught men that buildings largely made of unbaked mud bricks had to be raised above water level, raised, if need be, on an artificial platform, and that an earthen rampart was the best thing to keep out floods; common sense remarked that a rampart more sheerly built would keep out an enemy also, and so the town developed into a walled city.

The city was the political unit. Originally independent and self-sufficing, it owned as much land as its citizens had been able to secure, together with the villages and farms on that land whose inhabitants took refuge within its walls in time of stress. The most successful government was that which best upheld the

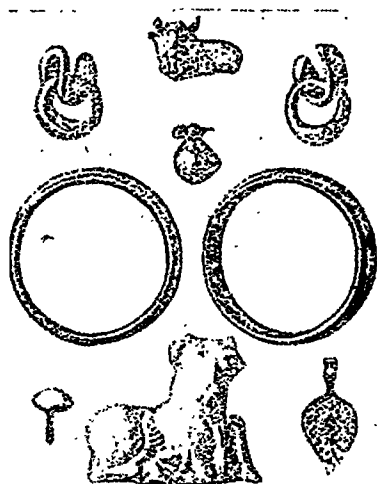
rights of landed property, and since such rights were at the bottom of most quarrels with neighbouring cities, and quarrels were frequent, the simplest course was to conciliate interests by uniting the cities. It was a policy likely to appeal to an ambitious governor, and as the classes that mattered were akin, so that there was no question of foreign control, and as the people asked little more than that their rights of property should be respected, and that they should be left to settle their domestic affairs themselves, imperialism ran counter to no principles. After the Flood the rulers of Kish were the first to secure hegemony over the whole country, and they held it, according to Babylonian stories, for countless generations. After Kish, Erech

had its turn of overlordship, and then Ur.

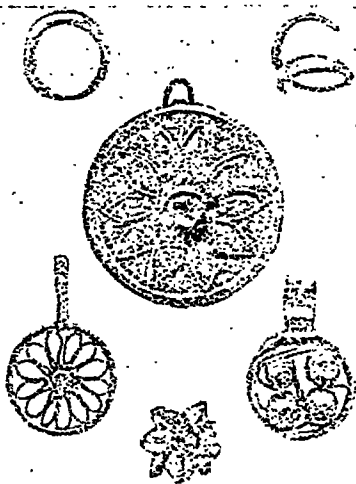
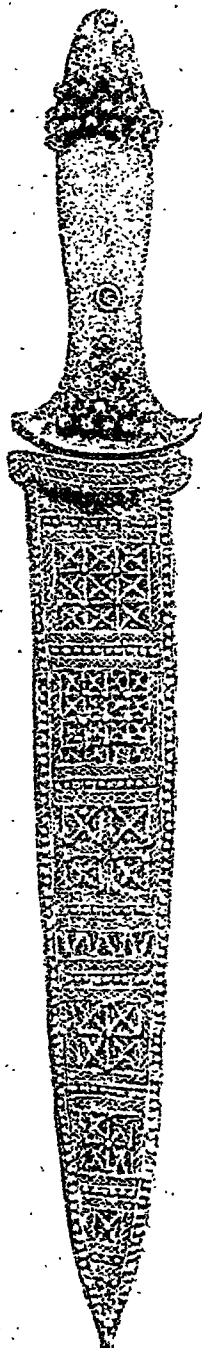
The royal palace at Kish bespeaks a high degree of luxury. Built of crude mud brick over an artificial platform, it was approached by a broad flight of steps leading to a gateway set back in a decorated recess; an open court with a colonnade of brick columns gave light to the inner chambers, and brick columns also supported the roof-beams of the principal apartments. The walls were adorned with slabs of slate encrusted with figures in shell and mother-of-pearl, scenes of pastoral life or of the king's victories over his foes; ruined as the building is, one can see that it was once a palace indeed worthy of a king.

Construction of the
palace at Kish

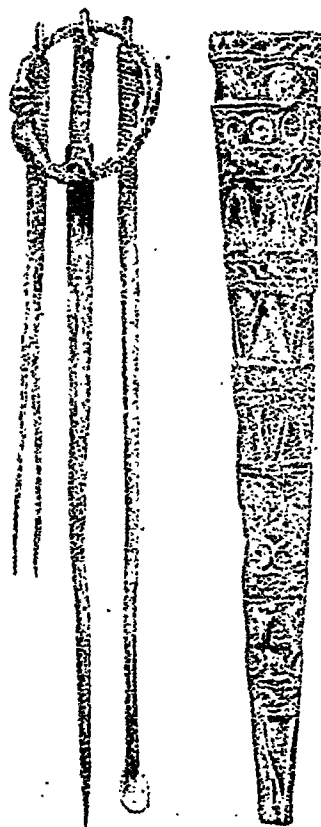
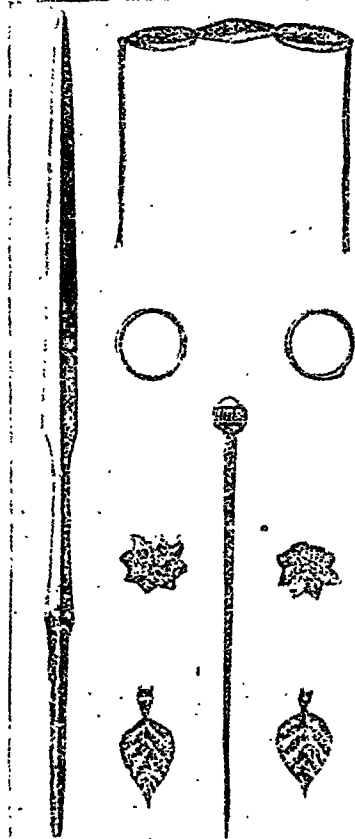
The most interesting single object found at Kish is a small stone tablet with the earliest writing yet known in Mesopotamia. The signs engraved on it are drawings of objects, a foot, a hand and the like, and illustrate how in the beginning the Mesopotamian script was picture-writing. At first each picture meant the thing which it represented; then, since not everything could be drawn, it might lose the *meaning* and keep only the *sound*,



The large bull is made of shell ; the small bull, rings, ear-rings, leaf and other ornaments are all of gold.



This jewelry is of the First Dynasty period, but the other objects in this page must be 400 years older.



ASTOUNDING CRAFTSMANSHIP IN GOLD FROM PREHISTORIC UR

Archaeology has shown that there must be some truth in the legends that speak of kings thousands of years earlier than the First Dynasty of Ur (c. 3100 B.C.), for most of these objects, in spite of their amazingly mature craftsmanship, must be dated to 3500 B.C. The spear-head, pin, ear-rings and ornaments on the left are of gold ; the dagger in its gold filigree sheath is of gold, with a lapis handle ; gold is the vanity case with tweezers, stiletto and ear-scoop on a silver ring.

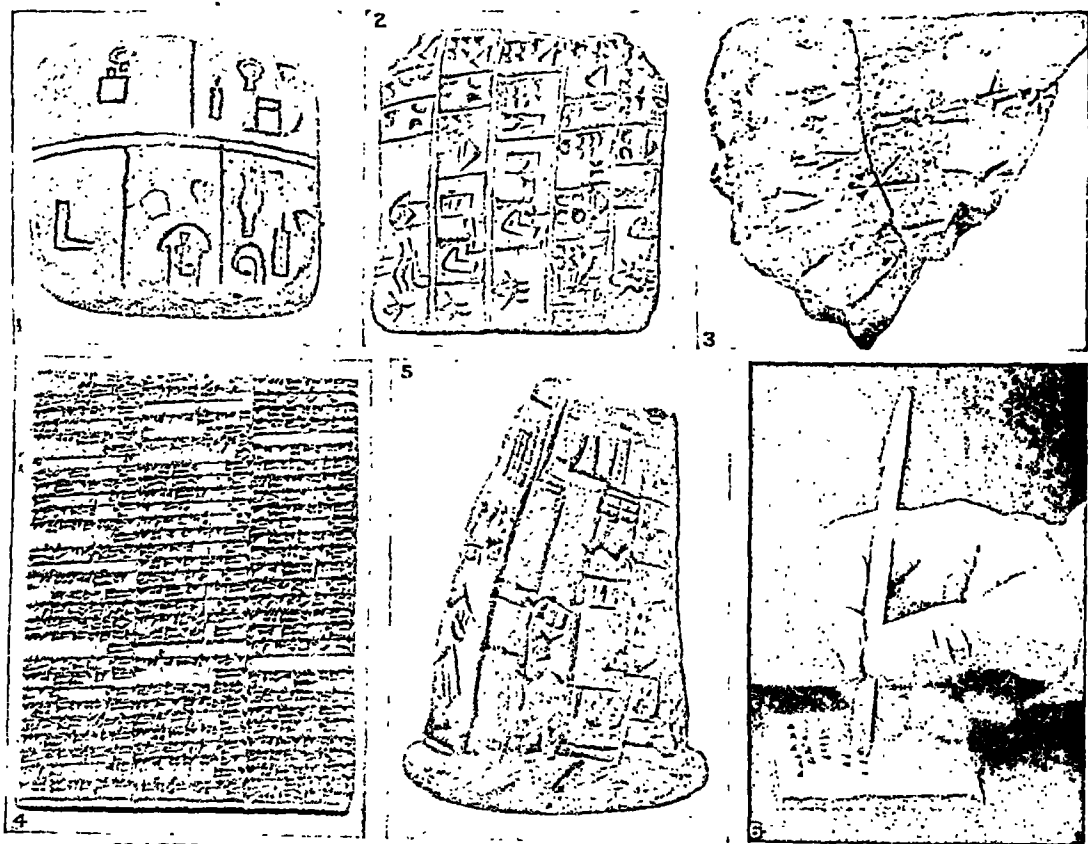
Courtesy of the Joint Expedition to Ur

the ideogram becoming a syllable, so that, were it in English, one could write the word 'awkward' by sketching a bird and a room full of beds—a sort of charade on paper. Babylonian writing never developed into an alphabet, but remained to the end syllabic, some of the signs being also ideograms, that is, meaning the thing which they originally represented, while others were introduced as determinatives to warn the reader of the character of the word following, so that the name of a tree would be introduced by the sign for 'wood,' and the name of a god by the symbol of divinity (see also Chap. 35).

Further, since stone was rare and hard to engrave and paper was unknown, men used instead tablets of stiff clay, first drawing the signs on the smoothed surface with a sharp point, later impressing them with the edge of a triangular-headed

stylus. This second method was better suited to the nature of the clay, but since only straight lines or wedge-shaped marks could be produced, it led rapidly to a complete change in the character of the script; the picture-signs lost all their realism and became mere conventional symbols which had to be learnt to be understood; people forgot their pictorial origin, and on stone as well as on clay used exclusively that formal writing which, from the wedges that compose it, we call 'cuneiform.' The tablet from Kish, primitive though it be, is an historical monument of the first importance, for it proves that already Mesopotamian man, by learning how to put his thoughts into writing, had made one of the chief steps forward in the march of civilization.

The temple of A-anni-padda, which like the much earlier village was at el-



STAGES IN THE EVOLUTION OF MESOPOTAMIAN CUNEIFORM SCRIPT

Engraved signs, representing material objects, on a tablet discovered at Kish (1) constitute the earliest example of Mesopotamian writing known (c. 3200 B.C.). Later, a more formal script (2), still largely pictographic, was evolved. The precise, angular cuneiform writing followed; and is exemplified above on a fragment of a student's exercise (3), a tablet covered with temple accounts (4) and a clay cone (5) that treats of engineering. How what is probably an ancient stylus—the pointed instrument used for cuneiform writing on clay—was used is also shown (from Kish, 6).

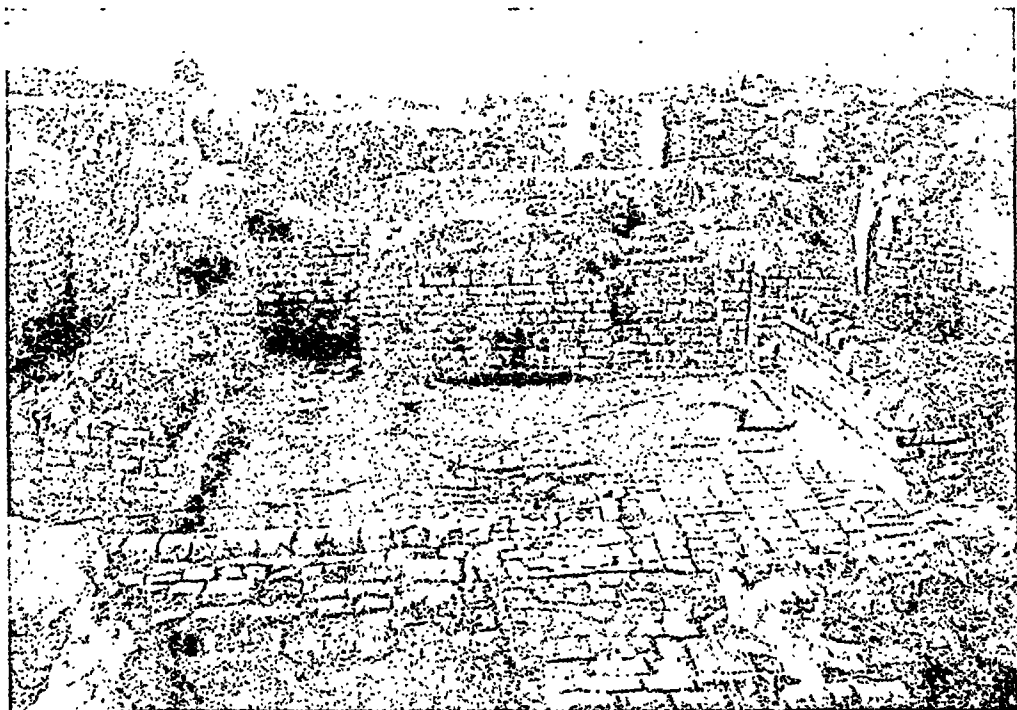
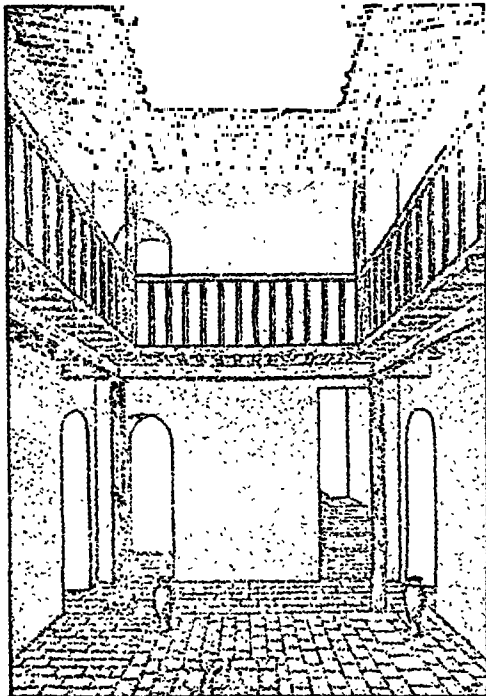
Nos. 1 and 6, courtesy of Dr. Stephen Langdon; remainder British Museum



Perhaps a king's funeral ; but the lions dragging the car suggest that the scene is mythical. Note the composite construction of the wheel.



A shell forms the body of this lamp, but a modelled neck and a stone head have been added to give it the appearance of a duck.

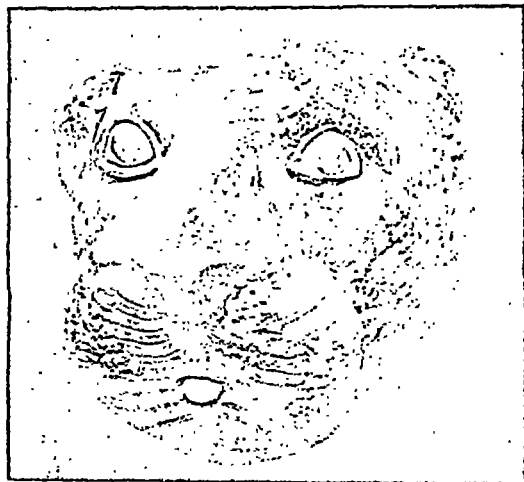


HOW ITS CITIZENS LIVED AFTER UR HAD WON AND LOST AN EMPIRE

Two periods at Ur stand out in history ; these discoveries date from before the one and after the other. The objects in the top left-hand corner antedate the earliest recorded dynasty (see page 517), while the house, preserved so faithfully that it can be reconstructed (see top right), was built during the Isin-Larsa period (c. 2150) after the fall of the Third Dynasty. We see the open, brick-paved courtyard, which must have been surrounded by a balcony because of the pillar base and the stairway to an upper floor. The doors lead to rooms.

Photos, C. L. Woolley ; reconstruction, A. S. Whitburn ; courtesy of the Joint Expedition to Ur

Obeid, illustrates the splendour of religious life. Set on a high brick platform, it was approached by a wide flight of stone stairs—the stone laboriously imported from abroad—at the top of which stood a porch with columns and roofing-timbers of palm-wood overlaid with copper; the



door was flanked by life-sized lions of copper with inlaid teeth and eyes, its lintel supported by columns encrusted with a mosaic of red and black stone and mother-of-pearl, and above the lintel a great heraldic relief in copper (see page 542). The outer walls were adorned with rows of copper statues and reliefs of cattle, and with flower-rosettes of red and black and white, while higher up there were copper-framed friezes of delicate inlay work in shell or limestone against a black background, rows of birds, processions of cows, scenes of domestic life. Inside there were statues carved in stone and stone vases inscribed with the record of their dedication by pious donors.

If so much has survived the wreckage of five thousand years we can imagine the wealth which enriched the temple in its prime. We have here proof not merely of barbaric luxury, but of high technical skill on the part of the craftsmen of Ur



TEMPLE BROUGHT TO LIGHT FROM THE DARKNESS OF SUMERIAN PREHISTORY

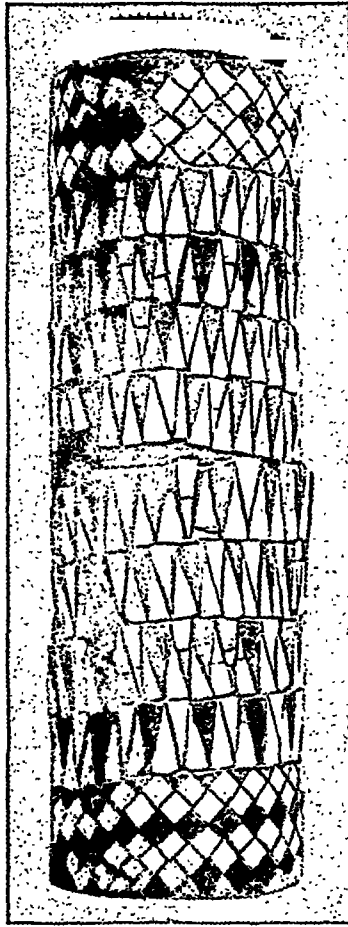
Close to Ur stands the ruined mound unnamed in history but now called Tell el-Obeid. It covers the successive ruins of three temples, of which the earliest, by far the best preserved, was built by A-anni-padda of Ur's First Dynasty (c. 3100 B.C.). Below is a portion of the façade—the temple stands on a platform and so must be reached by stairs. Above, one of the lion's heads found on the site, of copper filled with bitumen and inlaid with jasper, blue schist and shell.

Courtesy of the Joint Expedition to Ur and of Dr. H. R. Hall

and of high artistry to inform it; the lavish use of bright copper against wooden panelling or white-washed brick, the gay colours of the mosaics, may be too Oriental for our taste, and the subjects of ornament were chosen for religious rather than artistic reasons; yet not only does the work in detail show a complete mastery of the material employed, but the general design of the little building proves that before 3000 B.C. the science of architecture and the principles of applied decoration were thoroughly understood.

The age which followed was one of political turmoil; one city-state after another, some with Sumerian dynasties, some with Semitic, gained the dominion of the whole land by force of arms or disputed it with rivals too equally matched to submit to vassaldom. Yet it was an age of progress also. The armies which won for their master the suzerainty over the home country had still to be employed thereafter, and could be turned to foreign conquest; to the east the old enemy, Elam, had to be crushed times and again, and a Sumerian governor might administer the law in Susa; to the west the soldiers would raid as far as Syria so that a king of Sumer and Akkad could set up his trophies at Diarbekir and wash his feet in the waters of the Mediterranean sea.

And these adventures did not only open men's minds to new ideas and a wider outlook; their result, and to a large extent their motive, was the extension of trade. Victories in Syria meant the control of the silver and copper mines of the Taurus mountains, and the rights



TO SUPPORT A TEMPLE PORCH

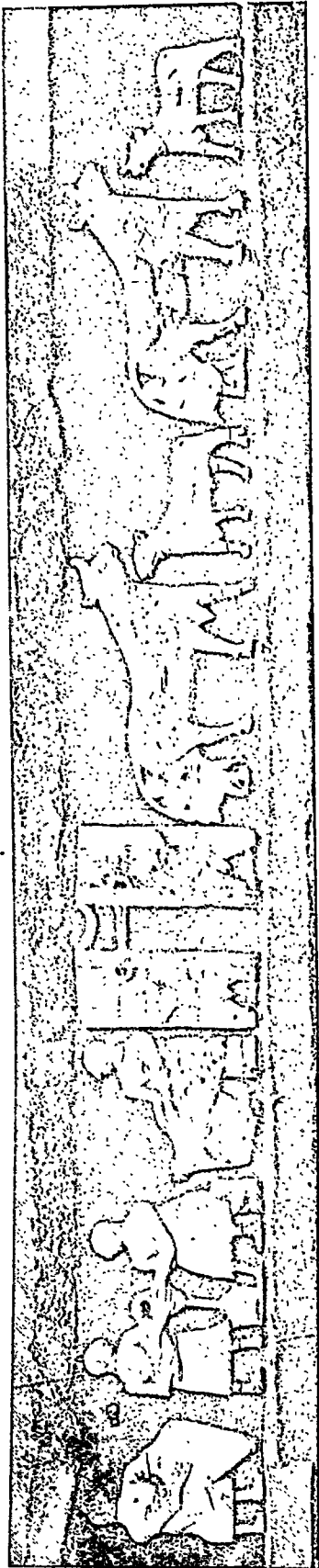
Flanking the doorway of the el-Obeid temple, as seen in the reconstruction facing page 528, were pillars of palm wood, now reduced to mud, their surface covered with mosaic work set in bitumen.

Courtesy of the Joint Expedition

over the precious cedar forests of the Lebanon. When Manishtusu of Agade crossed the Persian Gulf to attack a confederation of thirty-two petty kings his objective was the stone-quarries and the silver mines of the Elamite hills; Sargon of Agade led his armies into the heart of Asia Minor, to Ganes in Cappadocia, to protect a colony of Mesopotamian merchants who were carrying on business there, and he was careful to bring back from his campaign specimens of foreign trees, vines, figs and roses, which might be acclimatised in his own country.

Rich as was the great valley of the Two Rivers, its whole wealth lay in its agriculture and its pasture lands; for fine timber, for all metals, and for such luxuries as precious stones, in fact for stone of any sort, it had to depend on imports, and its prosperity was, of course, enormously enhanced when it controlled the trade routes and the sources of its foreign needs.

And there was another result of this troubled period not less important. Anarchy meant violence and corruption in high quarters and the oppression of the poor. When a ruler had succeeded in establishing his authority over the land by force of arms the best way to secure his position was to win popular sympathy by righting wrongs and reinforcing the law; this involved the enactment of new statutes and the reduction into legal form of customs and traditions, so that when at the end of our period Hammurabi (see Chap. 18) compiled the great code of law of which the well-nigh complete copy is preserved in the Louvre, he was



Unsophisticated and vigorously carved, these limestone figures admirably illustrate one aspect of the domestic life of the Sumerians: the scene is contained in a panel of the frieze that adorned A-anni-padda's temple at Tell el-Obeid. To the right of a rude byre we see cows being milked; they are accompanied by their calves, which are carefully muzzled lest they attempt to oust the dairymen. On the other side of the building a worker is pouring milk through a strainer which his companion holds for him, while others wait with the receptacles that will presumably contain the purified liquid.



More purely ornamental in character than the pastoral fragment seen above, the section of frieze in which the decorative theme is a procession of bulls constitutes an even greater artistic achievement. Every animal is composed of six or seven pieces of shell, each worked to give the nicest gradations of relief and a perfectly proportioned whole; the workmanship throughout is exquisite. The background of the frieze consisted of small black tiles of specially prepared paste, fitted together as in mosaic-work; they, with the figures, were fixed to a wooden board treated with bitumen. (Reproduction roughly quarter scale.)

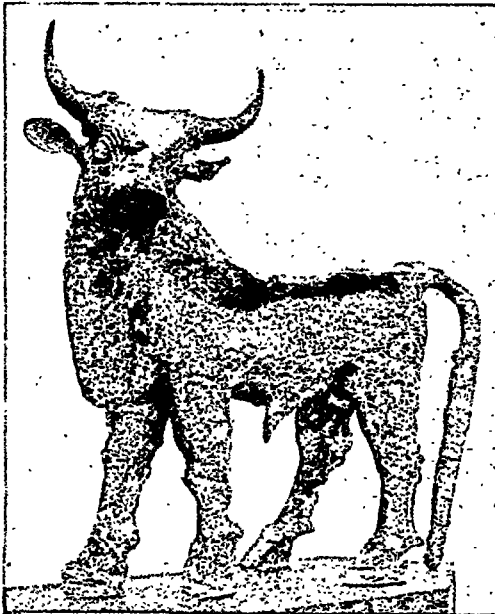
CATTLE AND DAIRYMEN MOST SKILFULLY REPRESENTED ON THE WALLS OF THE SUMERIAN TEMPLE AT TELL EL-OBEID

Courtesy of the Joint Expedition to Ur

able to draw upon a whole number of partial codes whereby previous rulers had sought to reform the abuses of their day.

Thus Urukagina of Lagash describes how the clergy and the higher officials of the government had taken to sharing between themselves the revenues of the gods and used the temple lands and cattle as their own; burial fees had become extortionate and could be reduced to less than a fifth; the private property of the poor was at the mercy of the rich and had to be protected by legislation. The king's boast was that he 'established liberty' in his realm.

The prosperity that might attend a time of peace is well shown by the records of Gudea, a governor of Lagash after that town had lost its suzerain powers. Only once does he mention a war, and that was with the foreign state of Anshan; but he talks much of his buildings and pious



BRILLIANT SUMERIAN SCULPTURE

The poise of the head and suggestion of deliberate movement in this statue of a bull from Tell el-Obeid show that the artist who carved it was a most intelligent observer and a craftsman of genius. It is of wood, encased in copper plates.

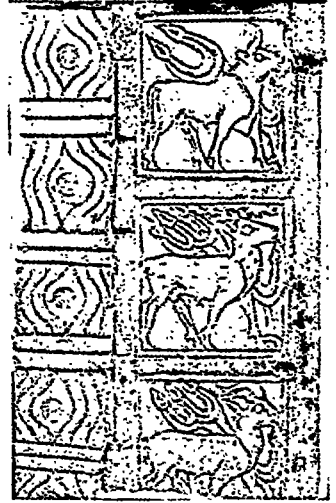
Courtesy of C. L. Woolley



VIVID ENGRAVINGS

The graphic art of the Sumerians is well exemplified in these engraved plaques of two crowned figures, and of a bull and deer, from Ur.

Courtesy of the Joint Expedition



foundations, and the wealth which he lavished on these proves not only his piety but the flourishing condition of his state. He encouraged foreign trade and was a patron of the arts; there are sixteen statues of him extant to-day, one of which shows him as an architect holding ground-plans and measure; and he won divine honours from a grateful people.

The establishment of the Third Dynasty of Ur about 2400 B.C., by Ur-Engur (or Ur-Nammu, as his name is now more accurately read) once more brought the whole of Mesopotamia under one rule and guaranteed peace and decent government. It is true that there were still wars to be fought on the distant frontiers, and even the heart of the River Land was as always exposed to raids from east and west—indeed, the whole fabric of state built up by Ur-Engur was doomed after less than a hundred years to collapse before the inroads of the hill-men of Elam. Life was not wholly stable, but there was at least a phase of calm of which Mesopotamia took full advantage.

For the era which follows the historian has far more material at his disposal and can study in much greater detail the life of the people; not only are written records now more or less continuous, but the excavations at Ur of the Joint Expedition of the British Museum and of the Museum of the University of Pennsylvania have brought to light many of the buildings and monuments of the capital city and give us an idea of the setting of life.

At the head of the state stood the king. The theory of the old city state had been that God, the particular god who was the city's patron, was really king and that the human being who was called king or governor was his vice-regent; and this theory was never forgotten, but it might lead to difficulties when the city state no longer stood alone. If the men of Umma conquered Lagash it was the victory of the goddess Nisaba over Ningirsu the god of Lagash, and rebellion against Umma would have the extra sanction of religion.

When one city, Babylon, had maintained its supremacy sufficiently long, it could so tamper with the religious legends which were common to the whole land as to

legalise the pretensions of Marduk its god to the headship of the pantheon and thereby eliminate one great motive for discontent; but with the earlier and more ephemeral dynasties that was impossible, and a simpler solution was devised. The king was deified, and each city under his sway could then combine its traditional Kings deified for worship with that of a new political reasons god common to all the country, the favourite, the adopted son or the husband of every local deity. Thus, though God was king, the king was also god, and as such stood immeasurably apart from and above his subjects.

Below the king society was divided into three classes. At the top came the 'amelum' or freemen, apparently the whole body of clergy and government officials, then the 'mushkinum,' freemen but of a subordinate type, the poorer middle class, and at the bottom of the scale the 'wardum' or slaves. The distinction was a very real one. Thus, in a case of assault, if the victim were an amelu, the punishment was an eye for an eye and a tooth for a tooth, whereas, were he a mushkinu, a fine would settle the matter; but conversely the guilty party was punished more severely if he were an amelu than if he belonged to the middle class, and a doctor would legally charge him twice as much as he would a mushkinu and five times as much as for a slave. (See further under Chapter 18).

In every department of life the freeman of the official class possessed privileges and was subject to responsibilities which marked him off from the freeman of the second grade, and the principle on which the distinction was based would seem to be the greater importance to the state of the function which he fulfilled. If that is so, it would have grown up gradually with the gradual crystallising of the traditions of state organization, and would be less developed in the Third Dynasty of Ur than we find it in Hammurabi's time; but the difference between freemen of either grade and the slaves was primitive and fundamental. The slave was the absolute property of his master, whether he were captured in war, bought, or born in service; he could buy or be given his liberty, and he



TRIUMPH OF A KING OF AGADE

In order to suggest his regal pre-eminence, the figure of Naram-Sin is very much larger and more majestic than any other in this stele. He is seen at the moment of victory, leading his troops up a mountain (see also page 431).

From J. de Morgan, Fouilles à Susa

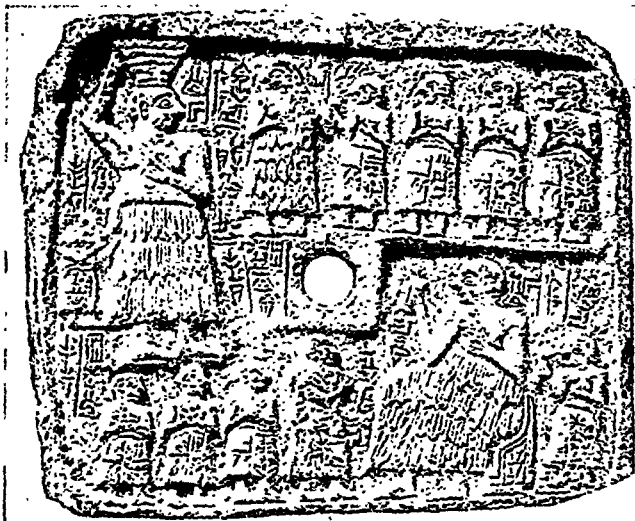
could legally protest against being sold; but to harbour a runaway slave was a very serious offence; he was branded, and he wore a distinctive dress, and if he suffered personal injury at the hands of a third party the compensation was paid not to him but to his owner.

If he enjoyed certain safeguards and privileges—he might own land or property and could give evidence in a law court—it was perhaps out of consideration for the higher grades, for a freeman might hand over his wife or son as a slave in payment of a debt, or again, a free woman might marry a slave, and the fact of his having certain rights would make her position easier. Babylonian slavery was probably of a fairly merciful sort, but the social gulf between freeman and slave was not lessened thereby.

The form of government was essentially personal, derived from the king, who appointed the necessary officials but was himself the fountain-head of law and the final court of appeal. The law of the land was for the most part traditional, that is, common law based on precedent, supplemented by royal edict; it was administered by local judges and by the clergy, every temple being a religious court.

In the old days of the city states the governorship of a city—which might rise to kingship—was hereditary in the chief family of the place; and even under the centralised rule of Ur

that might still be so, the supreme authority preferring to interfere as little as possible with local tradition and to utilise the existing machinery of government. The 'ishakku,' or governor, was responsible for the public works of his area; saw that the taxes were duly collected by the tax-farmers and the imperial dues forwarded to the capital; supervised the administration of justice; circulated the royal decrees; sent on legal cases of appeal; and carried out special orders



RULER ATTENDED BY HIS FAMILY

With a minister, conventionally represented as being of insignificantly diminutive stature, standing behind him, Ur-Nina, a despot of Lagash (c. 3000 B.O.) is represented receiving his children on two occasions. One of them is a princess, but her clothes are not to be distinguished from her brothers'.

The Louvre

of the king, with whom he was kept in close touch by the royal postal service.

The building or restoration of a temple was always regarded as the act of the king, even though the funds may have been drawn from the god's revenues; the royal name and titles, together with the name of the temple, would be stamped on a proportion of the bricks used, and under its foundations there would be set boxes of brick and bitumen each containing a copper figure of the king represented as a temple servant bearing on his head a basket of mortar, and a stone model of a brick inscribed with his dedication.

Another important duty of the ancient king, as of any modern government in Mesopotamia, was the upkeep and the extension of the irrigation system. The whole agricultural prosperity of the land depends on its water, and the making of a new canal or the cleaning out of an old one was a public service meriting due record; thus Ur-Engur boasts of having constructed a canal whereby ships from the Persian Gulf could come as far inland as the city of Ur, and people could grow onions and other vegetables on its banks. Looking at the sheer desert which to-day stretches around the ruins of Ur it is

difficult to realize that in Ur-Engur's time there was here a network of waterways and that cornfields and gardens reached as far as the eye could see. It is men's neglect that has turned a fertile land into a sandy waste ; to preserve and increase its riches constant supervision and labour were required, and the king saw to it that his lieutenants did not fail in their task.

The chief officer of the imperial service was the superintendent of the armed forces of the crown. He arranged the levy of troops, was head of a body which seems to have corresponded to the police, and further settled the calling up of levies for the great public works, most of which were carried out by *corvée* labour. In the field the king himself, as war-lord, took command of the army. There was no cavalry, the horse being yet unknown in Mesopotamia ; light troops were armed with the bow and the throwing-lance ; the main body carried lance, axe and some-

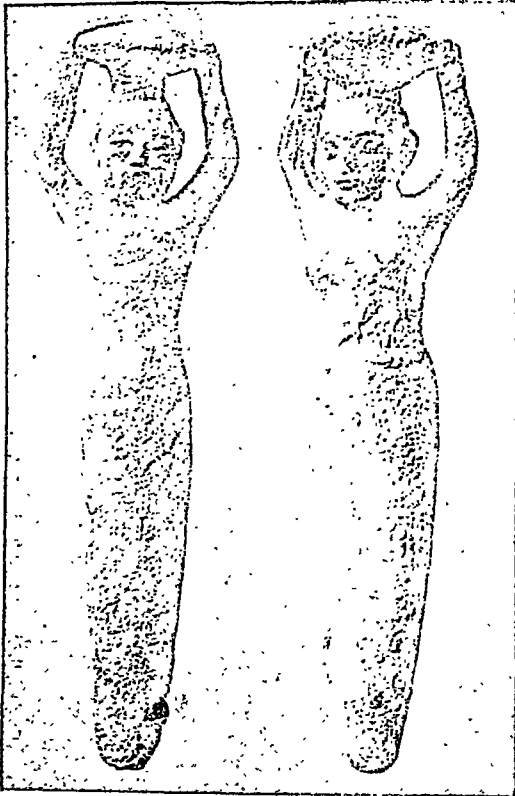
times a mace or war-club ; for shock tactics there was a deep phalanx composed of footmen protected by leather helmets and enormous square shields and armed with very long, heavy spears.

All weapons were of copper ; bronze seems to have been introduced rather later, and iron was unknown, or very rare, until the twelfth

century B.C. The senior ranks and the main fighting force, probably the heavy-armed men, were recruited from the *amelum*, the upper class of society ; the *mushkinum* performed camp duties and may have composed the light arm of the service ; slaves were exempt from military duties altogether. On retirement from the army soldiers could receive grants of land which was inalienable, provided that it was duly cultivated, and free from taxation ; the possession of such land may have carried with it the obligation to further service when required, and in that case we should have a custom not unlike that of the *fief* granted to a knight in medieval Europe. Soldiers captured in battle by an enemy were ransomed, and if their own means were insufficient for this the local temple, or failing that the state, had to find the money.

Apart from the army superintendent there were numerous palace functionaries, some of whom were household officials, while others had duties which took them farther afield. Such were travelling inspectors, judges, irrigation officers, architects, treasurers, secretaries and keepers of the archives ; while of the more domestic sort were the chamberlain, the managers of the royal estates, the master of the harem and the directors of live-stock, dairy-work, factories, fishing and donkey-transport. Most of these offices were duplicated in the great temples, where the household of the god was organized on exactly the same lines as that of the earthly king.

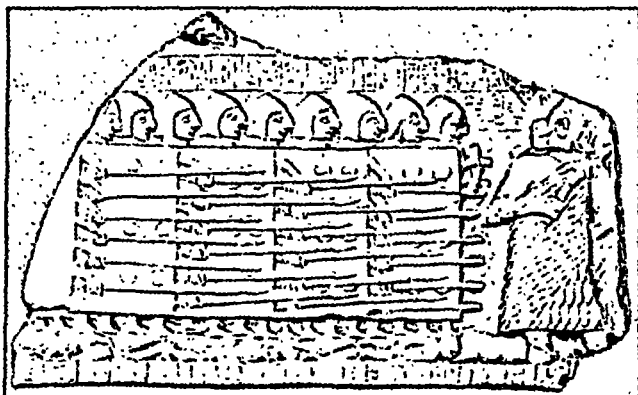
Now let us look at the material setting of the life thus organized by the state. Although agriculture was necessarily the mainstay of Babylonian prosperity, yet social life was essentially urban and the very forms of government envisaged rather a town-dwelling folk. The farm-



KING BEARING MORTAR-BASKET

When a ruler had a temple built he was conventionally represented, in small images placed with the foundation deposits, as an actual mortar-carrier ; these two copper figures of King Dungi (2391-2345 B.C.) are from his temple at Ur.

Courtesy of Joint Expedition to Ur



VICTORIOUS ADVANCE OF A PHALANX

Sumerian infantrymen and military tactics are well illustrated in the 'Stele of Vultures,' on which troops of Eannatum of Lagash (c. 2025 B.C.) are represented marching in a phalanx. The men are armed with heavy, copper-tipped spears, large shields and helmets that are presumably of leather.

The Louvre

labourer might still live in a hut of wattle and mud daub or under the goats'-hair tent which shelters his descendant at the present day, but business centred in the towns; even the big land-owner would have his town house as well as his country estate, and in the towns the standard of living had advanced far beyond the mud hovel.

In an alluvial land like Mesopotamia, where there is no stone whatsoever, the only building-material was brick, either crude mud bricks or bricks properly kiln-fired; but with such the Sumerian architect could produce buildings hardly less permanent or splendid than the stone temples of Egypt. Dispensing with ornament for the exterior, he relied for his effect on mass and line, strength and harmony of proportion taking the place of mere decoration; for the interior the bare brick-work would be hidden, in the case of a humbler private dwelling by plaster and white-wash, in a temple sanctuary by wooden panelling or by a costly mosaic of gold and silver, crystal and lapis lazuli, turquoise and carnelian. All this wealth has long since

vanished, plundered by many hands, but from the ruined walls we can re-create some idea of the ancient city as it was in its prime.

The buildings of Ur spread over a very large area, nearly four miles by a mile and a half; but the greater part of this was accounted for by suburbs lying outside the city proper; the latter, measuring something more than half a mile in length by a quarter of a mile in width, was enclosed by a massive brick wall, the work of Ur-Engur in 2400 B.C. Inside this again was another great enclosure measuring 400 yards by 200, the 'temenos'

(to adopt a Greek term) or sacred area of the city, wherein stood all the principal temples, the whole dedicated to the moon god Nannar, the patron of the town.

On a high platform in the west angle of the temenos rose the most conspicuous building of all, the 'ziggurat' or staged



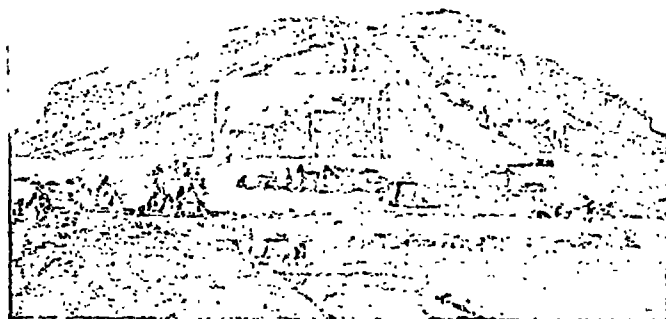
AN ARMY'S ACTIVITIES AFTER BATTLE

Apart from their helmets and shields, soldiers had no protective armour, wearing only a short kilt of hide. Here we see two of Eannatum's army busy about a heap of slain comrades; the enemy dead were left to the vultures—hence the name of the stele of which this is a fragment.

The Louvre

tower, whereon was set the moon god's central shrine. Every great Sumerian city boasted such a tower, erected in honour of its local god, the most famous and the largest of all being that of Marduk at Babylon, which has come down to us in story as the Tower of Babel; the Tower of Babel is to-day completely destroyed, but that of Ur, built on much the same pattern, is fairly preserved and the description of it might well stand for that of others too.

The reason for the ziggurat seems to be that the Sumerians were by origin a



mountain folk, whose gods would be gods of the hills, and they were accustomed to 'high places' and to setting up their altars 'on every high hill.' When they settled in the flat alluvial plains of the Euphrates valley they must have been sadly at a loss for a place where their god could be worshipped according to tradition, and so set to work to repair the deficiencies of nature by building artificial hills, easily impelled thereto by the real need which there was of raising every building on some kind of platform to secure its foundations against the periodic floods. The whole

area within the town walls was raised above the level of the irrigated plain, and each temple within the temenos stood on its own platform; but the ziggurat was something more than this. A mass of solid brickwork, its core of crude mud bricks, its face of kiln-fired bricks set in bitumen for mortar, with a base measurement of over 200 feet by about 150, it rose,

with slightly in-sloping sides and receding terraces, to a height of seventy feet, and it was upon this huge base that there was built the actual shrine.

On the north-east side three wide brick staircases, one coming right forward from the tower's face, the other two leaning against its wall, met in a gateway on the level of the second terrace and made a wonderful stage for the religious processions such as took place on the feast days of the god. Shallow buttresses relieved the plainness of the walls and accentuated the principle by which all lines led the eye inwards and upwards to the sanctuary crowning the whole; it was vastly impressive, and we need not wonder that 'the Mountain of God,' or 'the Hill of Heaven,' was remembered centuries later in the legends of an alien race whose ancestors had once lived under its shadow and watched the solemn priests pass up and down its stairs.

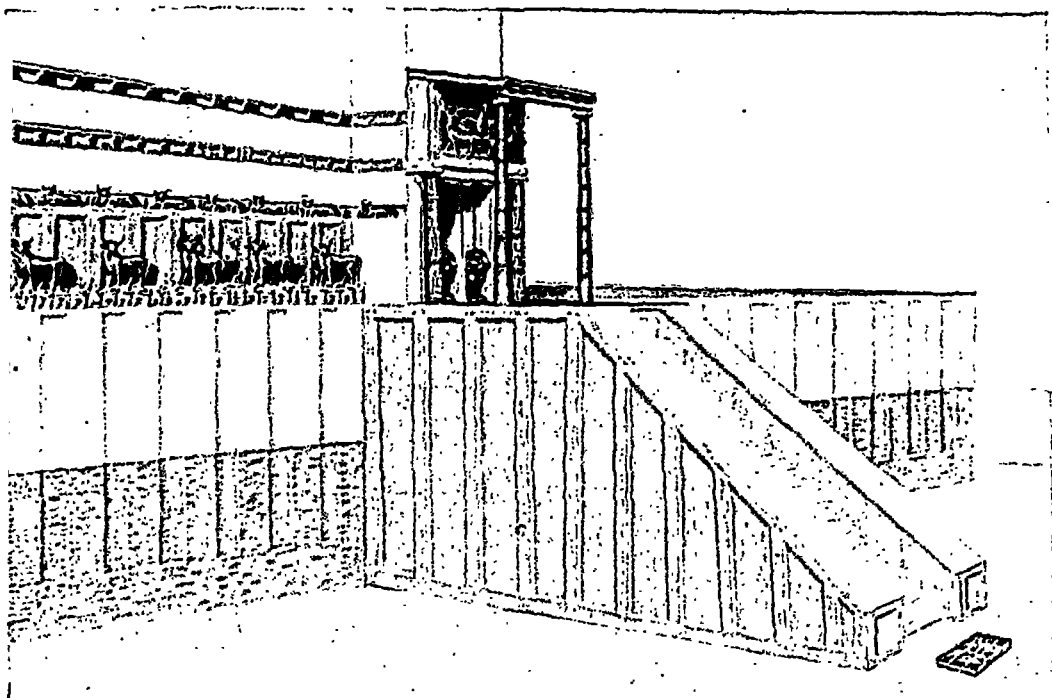


ARTIFICIAL TEMPLE-HILL AT UR

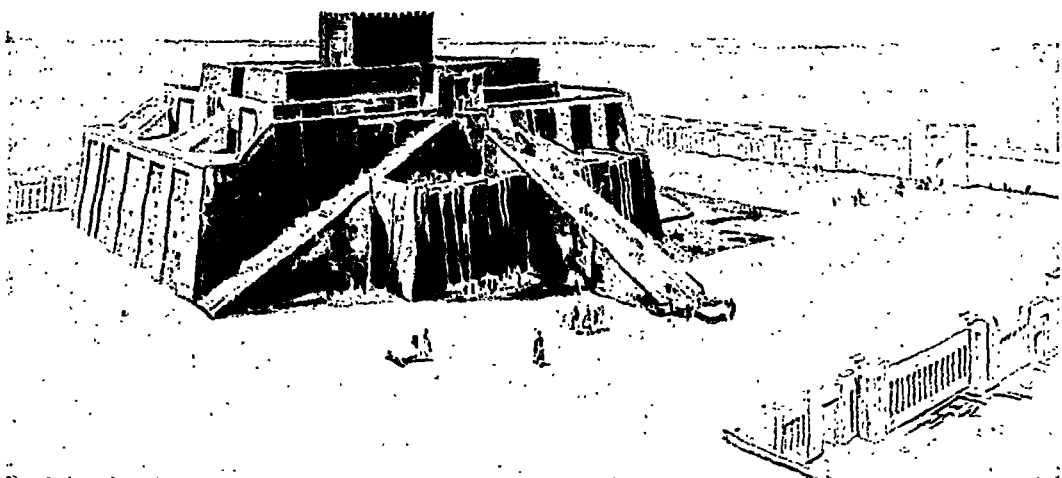
Although lacking the shrine that once stood on its summit, the ziggurat at Ur is still in fair condition. Here we see the three wide stairways (upper photo) that ascend from the ground to meet on the level of the second terrace, and the aspect of the mound from the great courtyard.

From the Antiquaries' Journal

Below the foot of the ziggurat stretched a great courtyard surrounded by a range of store-rooms, the main entrance passing beneath a two-storeyed building where the officials lived and worked; it was probably the receiving house for the temple dues. The god was a great land-owner, and since coined money was unknown the tenants of his estates paid their rent and tithes in



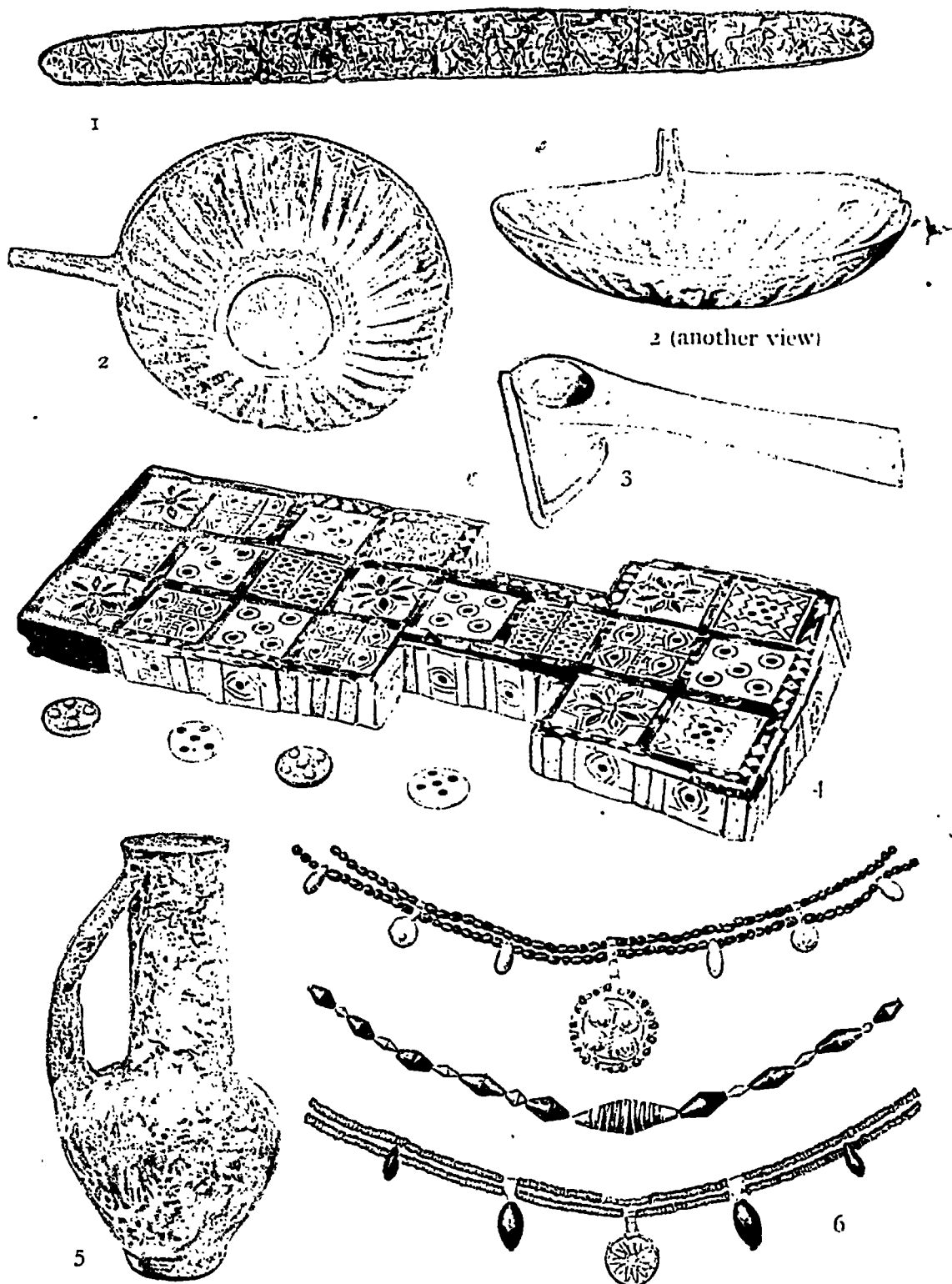
Many details of the important little temple built at Tell el-Obeid by A-anni-padda of the First Dynasty of Ur (c. 3100 B.C.), such as the pillars, the lions and the Imgig relief, are given in pages 520-23 and 542. This coloured reconstruction suggests their probable relations to the whole. If any structure occupied the part of the platform to the right of the steps, there is no evidence as to its character.



This mighty ziggurat at Ur was erected by Ur-Engur (Ur-Nammu) of the Third Dynasty some seven hundred years after the building of the shrine shown in the upper part of the page. No doubt there had been some earlier sacred building on the site, but this is the form in which it remained thereafter, to be restored by Nebuchadrezzar II in the sixth century B.C. and cleared in the twentieth A.D.

HOW THE SUMERIANS IMITATED THE MOUNTAIN SHRINES OF THEIR ORIGINAL HOME

Reconstructions by C. Leonard Woolley and F. G. Newton



TREASURES OF GOLD, SILVER AND JEWELRY FROM PREHISTORIC UR

The lower the excavators delved into the mound of Ur the richer and finer became the contents of the graves. The golden diadem (1) slightly antedates the First Dynasty (c. 3100 B.C.); the adze head (3) of gold alloyed with tin, giving a splendidly durable edge, together with the silver vase (5) and the necklaces (6) are older still; whereas the finely-engraved bowl (2) and the wonderfully inlaid draughtboard with its pieces (4) are dated to 3500 B.C.—a period nearly 5,500 years ago

Photographs by courtesy of the Joint Expedition to Ur



The significance of the ziggurat becomes clearer when we view it thus, obliquely from the air. It overlooks the ruins of Ur, and in the days of its grandeur the surmounting temple must have been the most conspicuous landmark for many miles around, towering above the highest building whose foundations were on the ground level. The mound stands within an enclosure (see below), the part of the ancient city dedicated to the moon god, Nannar, which contained all the important shrines.



Within the massive city walls of Ur was the temple enclosure whose plan, accurately traced by excavations, is here seen from above. Before and slightly to the left of the ziggurat, which is in the western corner, are the ruins of E-nun-makh, the shrine of Nannar and his consort. Farther to the left are remains of a great temple devoted to the moon god himself. Outside the temenos were compact residential and business areas, with widely extended suburbs beyond the city walls.

DISTRICT IN UR 'OF THE CHALDEES' GIVEN OVER TO THE CITY'S GOD

Photo, Royal Air Force Official, Crown copyright

kind ; storage room was therefore needed on a large scale. The farmer would bring in grain and oil, cheese and clarified butter (the cooking butter of the East), wool and hides and hemp and flax ; the townsman would bring, according to his trade, scrap-copper, cloth, gold or manufactured goods ; and close by there was a quay at a canal-head where the ships would come from over sea with cargoes of timber and stone, gold and copper ore, precious stones and incense gum destined for the temple ; and all these had to be checked and weighed and stored in the magazines.

A whole staff of secretaries and scribes was required for such work ; for everything brought in a receipt was given, written on a tablet, and a duplicate

Busy scene in a temple court copy of the receipt was filed in the temple archives.

It must have been a busy scene in the great court as the laden donkeys passed in and through the gates and the sacks and jars were unroped and their tally taken, with much loud-tongued protestation and dispute, while the checkers called out names and weights and the slaves hurried up with the tablets of stiffly-kneaded clay and the witnesses sealed what the scribe had written.

This court lay at the extreme end of the sacred area. Beyond it came the temples proper, the temple of the moon god himself on one side of the ziggurat, occupying part of the same platform, on the other side that of Nin-Gal, his wife ; and next again the shrine common to the two—the 'harem' as it were, of the god. In all these there was no uniformity of plan. The 'harem' temple was a little five-roomed sanctuary hidden away in the centre of a block of store-rooms and service chambers ; the Nannar temple consisted of a small shrine with flanking chambers all opening on to a central court.

Far more elaborate was the temple of the moon goddess, Nin-Gal. This was built like a fortress, with heavy outer walls and defensive towers, and contained two distinct temples and several minor shrines. One of the temples resembled in plan that later built at Jerusalem by Solomon, having its outer and its inner court, a holy place through which one passed to the Holy of Holies, and round the courts, or

between them, vestries and service chambers, rooms for ceremonial washings and for the offering of incense.

The other was altogether different ; from a central court a succession of great doorways led directly to the sanctuary. Behind this lay the temple kitchen where the sacrificial feasts were cooked, with its bread-oven and cooking-range, fireplaces for heating water, brick table for cutting up the victim and its well sunk through the paved floor. Different again was the adjoining shrine, Dublal-Makh, whose simple two-roomed sanctuary faced on a great open court entirely surrounded by a range of chambers wherein the written archives of the temple were stored and all sorts of trades carried on.

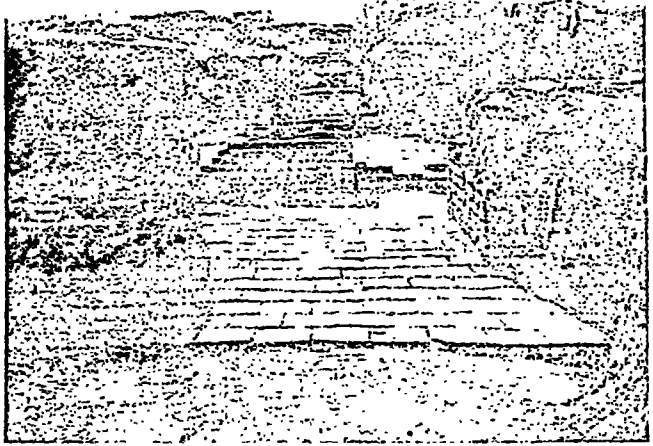
The fact is that this sacred enclosure, the Shrine of Nannar, was not a temple in the normal sense of the word ; rather it was like a medieval monastery, wherein besides the great church and the many subordinate chapels there were buildings of a more secular sort covering a far larger area—dormitories, store-houses, refectories, workshops and libraries. Here, too, there had to be quarters for the priests, for the temple servants and for the women attached to the service of the god, as well as for the children who were trained and educated in the building.

Moreover, we have seen how into the temple precincts the god's tenants brought in kind their dues and offerings. These had not only to be stored, but to be turned to account: thus the women devoted to the city's god spun the wool into yarn and wove it into cloth, the raw copper was melted and cast or hammered into vessels, the metal and precious stones were used for making statues or adorning the shrines, and all the people so employed, as well as the priests, had to be clothed and fed. This meant yet more clerical work, for everything was done most systematically.

We have found thousands of tablets dealing with the stores, since for everything given out there was drawn up and filed an issue-voucher stating names and quantities, the purpose of the issue and its authority, duly signed by the two parties and the witnesses. Other tablets

deal with the factories, both those on the temple premises and the private factories which contracted for the temple work; these give nominal rolls of the women employed, for instance, in weaving, the amount of raw wool issued to each for the month, the quantity of cloth made by each according to its quality and weight, with proper allowance made for unavoidable waste in manufacture, and then, in parallel columns, the amounts of various food-stuffs supplied to each worker—bread, cheese, meat and so on, representing the cost of production.

All this gives us a remarkable idea of the business-like methods of the ancient Sumerians, and such methods were not confined to the temple, but pervaded every activity of life. No business transaction was legal unless recorded in writing. Deeds of sale, leases, loans, marriage contracts, deeds of partnership and their dissolution, contracts for building or anything else, as well as all decisions of the courts of law, were entered in



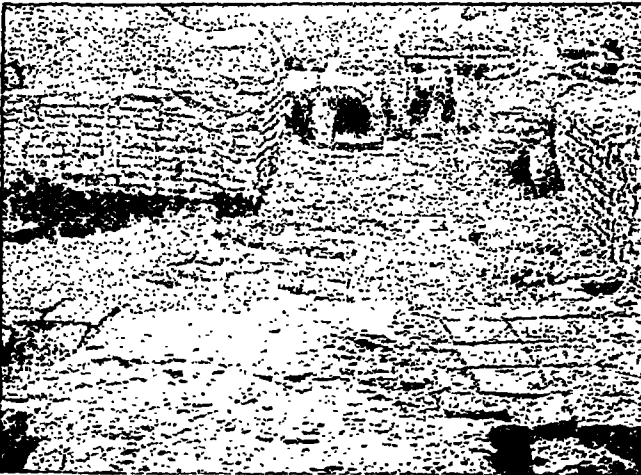
HOW A KING HONOURED HIS GODDESS

Among the most elaborate of the ruined temples at Ur is the 'Gig-Par-Ku, built by Bur-Sin (c. 2345-2336 B.C.) to Nin-Gal, his lady.' Many of its chambers are in an excellent state of preservation. Here we see its brick-paved main courtyard, with the rectangular altar at the far end.

Courtesy of the Joint Expedition to Ur

writing. In every legal action appeal was made to 'the tablet,' nor was it easy to maintain a claim without its evidence; only where in the nature of the case written proof was impossible an oath was taken in the name of the gods and of the king. Generally therefore, for greater security, copies of the tablets were registered in the temple—often enclosed in clay envelopes on which an abstract of the contents was inscribed—and so many have been preserved that precedents could be quoted for almost every kind of case.

It can be easily understood how important and how numerous must have been the class of scribes, and since their duties were so intimately connected with the temples it was in the temples that they were taught and trained; there were regular schools where boys were instructed in the art of writing—the dictionaries and syllabaries which they used have often been found, and even the clay 'copy-books' with the master's fair copy on one side of the tablet and the pupil's attempt



WHERE FOOD WAS COOKED FOR TEMPLE INMATES

Nothing better helps us to reconstruct the manifold life of the great Sumerian temple foundations than the excavation, in the Gig-Par-Ku temple at Ur, of an open-air kitchen, with cooking-range, here visible in the background, and chopping-table of burnt brick covered with bitumen, on the left.

Courtesy of the Joint Expedition to Ur

to reproduce it on the back. Other subjects in the curriculum were arithmetic, in which the basic numbers were six and ten, proceeding as far as arithmetical and geometrical progression and the extraction of square and cube roots; geometry, chiefly from the point of view of land surveying; and astronomy, principally for the understanding of the calendar. A pupil thus educated ranked with a temple priest or a government official in the social scale.

The great complex of religious buildings which housed so many and different activities was laid out on spacious lines with broad courts and

Contrast between open spaces, massive Temple and City walls and terraces, culminating in the ziggurat and all enclosed within the fortified circuit of the temenos. But outside the temenos wall lay the city proper, and here conditions were by no means the same.

So far as we can see there was little attempt at town planning. There may have been a few broad and straight streets converging from the city gates on the temenos enclosure, but for the most part narrow and crooked lanes wound between the blank walls and doorways of the huddled houses. At a sharp corner the brickwork might be rounded off so as to make the passage easier for the passer-by, but the streets were for the most part unpaved and rough, in wet weather regular gutters wherein the mud lay deep, and probably none who owned donkeys would choose to go abroad afoot.

By 2000 B.C. a type of middle-class house had been evolved which in almost every detail anticipated the well-to-do house of modern Bagdad. The front door led through a small lobby into a central courtyard, off which opened the rooms of the ground floor and the staircase going up to the upper storey. Facing the entrance was the reception-room to which guests would be taken; on one side would be the kitchen with its mud fire-place and perhaps one or two rooms for the servants; under the return of the stairs was the little tiled lavatory; in some houses there was also on the ground floor a private chapel, a long narrow

room with raised 'chancel' and altar, beneath the pavement of which lay the family burying-vault. In the central court upright posts set near the angles supported a wooden balcony which ran round the interior of the house; the eaves of the house roof were prolonged so as to shelter this, and only a square opening was left in the middle to supply light and air to the court; the drainage from the roof was taken by a soak-pit in the middle of the courtyard pavement. The stairs led to the balcony and on to this opened all the upper rooms, the plan repeating that of the ground floor; these upper rooms were probably the living quarters of the family. Of course, the poorer houses were smaller than this and often only one storey high, while a wealthier citizen might boast a house with two courtyards each surrounded by its range of chambers.

The walls were built with burnt bricks below and crude mud bricks above, the proportion of the former depending on the owner's means; they were always mud-plastered and generally whitewashed, while the details of doors and windows might be picked out with red and black paint. The floors, at least of the better rooms, were paved with burnt bricks. By 2000 B.C. doorways were usually arched in burnt brick; the doors themselves were of wood, turning on a

long hinge-pole which went down through the floor, its lower end shod with metal and resting on a socketed stone; in the case of a temple the stone would bear an inscription giving the name of the building and of the king at whose expense it was put up, but in private houses the hinge-stone was always plain.

Windows, on the ground floor at any rate, were very few and gave on the central court, never on the street; the desire for privacy seems to have been as strong in the ancient as in the modern East. Generally there were no windows at all on the ground floor, the rooms deriving all their light and air from the high doorways, an arrangement well suited to Mesopotamia with its glaring sun and excessive summer heats. Shutters were of wood and

Planning of a Babylonian house



STREET WHERE DWELT THE MERCHANTS WHO ENRICHED UR 'OF THE CHALDEES'

The majority of the 'streets' in Ur might more properly be called lanes, since they are very narrow and winding, and no attempt was made to pave them. The buildings that line them, however, are of great interest, in giving us an idea of early domestic, as opposed to ecclesiastical, architecture. The houses in this thoroughfare were erected during the Isin-Larsa period, that is to say, about fifteen hundred years before the Chaldaeans gave their name to the city.

Photo, 'The Times'

wattle-work waterproofed with pitch. The roofs were flat, made of palm-logs covered with matting and reeds, with mud plaster above—the normal roof of the modern Mesopotamian house, cool in summer and remarkably rainproof in winter.

The systems of corbel vaulting in brick and of barrel vaulting were known and commonly used in tombs; in private houses they do not seem to have been employed, but there can be little doubt that vaults and perhaps even domes adorned the temples of the gods.

Over the floor were spread mats exactly like those used at the present day, and in the richer houses rugs and carpets. Stools and chairs with wooden backs and arms had rush-bottomed seats and sometimes castors of copper or silver; beds with string mattresses stretched on a wooden frame, wooden chests for storing clothes and low tables, generally tripod-shaped, completed the simple fittings of the rooms.

At night illumination was supplied by a primitive lamp, an open saucer wherein a wick floated on the oil. Water had to be fetched from the public wells outside, but almost every house would have its own drain—a drain made of terra-cotta rings going down vertically into the ground, each ring pierced with holes and surrounded with a packing of broken pottery so that the water could escape into the surrounding soil; lead-pipes into these drains were sometimes trumpet-mouthed, sometimes more like modern drain-pipes, flanged at the joints and secured with bitumen.

It was the custom to bury a dead man beneath the house in which he had lived, either in the chapel or, if the house did not possess one, below the floor of any of the rooms. The pavement was lifted and a hole dug, and when the grave was complete and the funeral rites over the flooring was relaid and the room



GODS WORSHIPPED WITH A DRAIN

Efficient vertical sink-drains, made of clay rings, were a feature of Babylonian civilization; what is strange is that they were used not only for household sanitation, but also in connexion with the worship of the gods of the underworld.

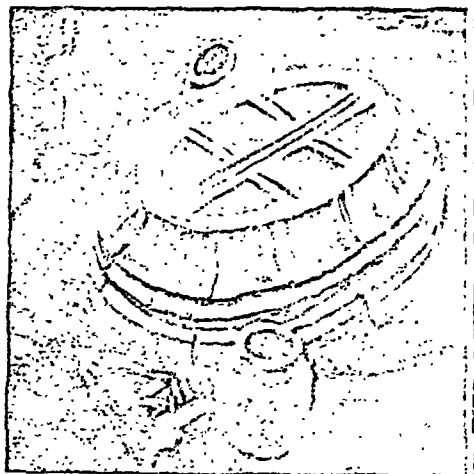
continued in use. Strange as this may sound at first, it is not very unlike the habit, common until recent days in England, of burying below the church floor.

Of graves there were two sorts, the clay bath-shaped coffin and the brick-built vaulted tomb. The dead man, wearing his ordinary clothes and wrapped in a mat

or in a linen winding-sheet, was laid on a mat, his head resting on a fringed and tasselled cushion, his body on one side with the legs bent up and the arms also bent so that the hands came in front of the face—it is the same 'embryonic' position of the old days at el-Obeid. Between his hands was set a little vase or bowl of water; with him might be put such small personal belongings as he might need in the next life—a dagger, a razor, or, for a woman, her necklaces and bangles. Then the clay coffin was inverted over the body, or the door of the tomb was bricked up; outside were placed vessels of food and drink, and the earth was filled in.

The brick tombs were regular family vaults, and as such were constantly re-used (we have found as many as ten skeletons in one grave); and coming as they did immediately below the floor of the room they must have been very insanitary. Indeed, the wide extent of the ruins of the ancient towns may in part be accounted for by this practice, for a house, or a whole quarter, may at times have become uninhabitable and the inhabitants have moved elsewhere until nature had purified their family graveyard.

In the earliest times the men wore a sheep-skin with the fleece left on outside, tied round the body below the armpits. The locks of the fleece were twisted into



HOW THE BABYLONIAN DEAD WERE INTERRED BENEATH THEIR HOUSES

Two methods of burial existed side by side in Babylonia, and it is hard to see what dictated the adoption of the one or the other, except family tradition. A man was either buried between mats with a clay coffin shaped like a bath tub (left) inverted over him, or else laid under the house-floor in a corbelled vault of brick such as that on the right; in the latter case the tomb was used repeatedly. Both the examples above are at Ur.

From the Antiquaries' Journal

rows of formal tassels; very often this garment, which became the traditional dress for ceremonial use, was imitated in woven material. Later the costume grew more elaborate, and the men of the better class wore a shirt, and over that a long cloak cut coat-fashion with full sleeves and fringed edges, while the workman contented himself with a short skirt fastened by a belt round the waist. A knitted skull-cap was used by the poorer people; the rich wore over this a turban coiled smoothly round the head, or sometimes, apparently, a head-cloth kept in position by a twist of rope, like the 'kefiyeh' and 'agail' of the modern Arab.

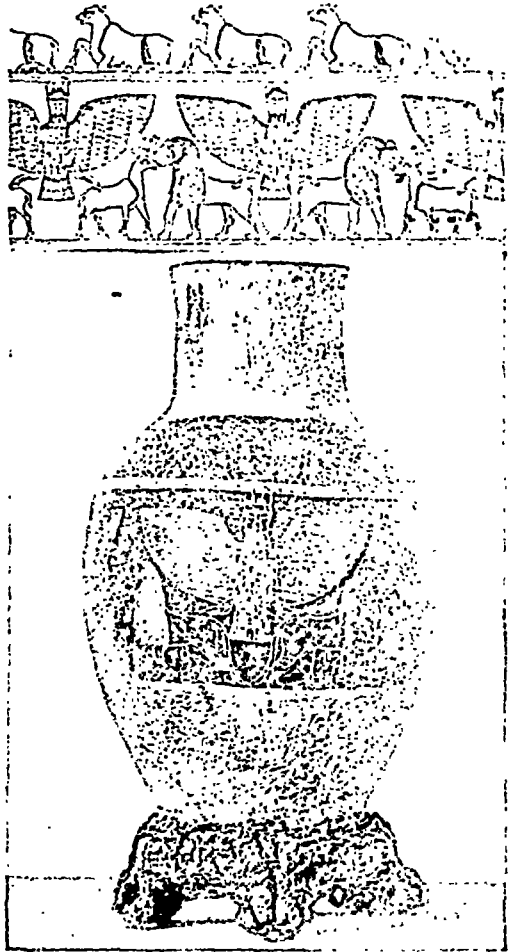
The king had the privilege of wearing a long beard, carefully combed and curled, somewhat after the fashion of the gods as they were portrayed in their statues; and his hair, too, was allowed to grow down over his shoulders. People of the lower class, the mushkinum and the slaves, wore a natural short beard and the hair was only long enough to make a heavy roll along the back of the head; but the priests were clean-shaven as to both chin and head, in the interests of the ceremonial purity which religion demanded.

Women in the early period had a two-piece costume consisting of an under garment reaching to the feet and a long-sleeved coat which hung straight from the shoulders to the ground, fastened at the shoulder with a straight pin of copper; this continued long in fashion, but for ceremonial occasions

there was worn a complete dress with full sleeves, very wide in

the skirt, made in a series of flounces of curiously early-Victorian style. The coiffure of the women was elaborate; the hair was crimped in front, so as to form a wavy band across the forehead, and long curls hung down in front of the shoulders; on the head was worn a sort of fillet—a ring perhaps of twisted cloth, perhaps of metal—and the back hair was either allowed to fall down the back in carefully curled strands or was coiled up and passed through the fillet so as to make a 'bun' with a fringe below.

In a public place a woman would cover her face with a veil. The outer garments



A KING'S SUMPTUOUS SILVER VASE

Babylonian pottery was plain and uninteresting except in the prehistoric period; but the metal-work could be magnificent. A splendid silver vase for Entemena (c. 2950) shows Imgig, the heraldic lion-headed eagle of Lagash, with lions, bulls, stags and goats (see drawing above).

The Louvre

were generally of dark colour, brown, blue or black, the inner white, except for festival occasions, when only white was worn; but this sober attire was varied to some extent by the coloured fringes on the veil and cloak. The women wore quantities of beads, often a high 'dog-collar' round the neck, and simpler strings on the wrists; besides gold and silver, crystal, carnelian and lapis lazuli were most commonly employed, together with beads of blue glazed frit, and on the necklaces were various amulets and charms. The pins, too, which secured their dress sometimes had ornamental heads of precious metal

and stones, and bangles of gold or silver might be worn on arms and ankles. Both men and women wore shoes or sandals of leather, but these were for walking abroad only; in the house they went barefoot.

Every Sumerian freeman, and many of their womenfolk, carried a seal. Where all business transactions were recorded in writing and most of the commonalty could not write, the seal was indispensable for attesting documents; its impression on the clay tablet was equivalent to the owner's signature. In the time of the Third Dynasty of Ur the seal was invariably a cylinder from three-quarters of an inch to an inch and a half long, made of stone and engraved usually with a scene in which the owner was shown being introduced by his particular patron deity into the presence of the city's god; his name and titles might be inscribed in vertical columns of writing behind the god's figure. The cutting of some of these is exquisite,

making of them veritable works of art in miniature, and they might well rank as jewelry; indeed, they were sometimes strung with ordinary beads as ornaments of a necklace, but usually they were mounted on a metal axis for easier rolling and carried singly on a string round the neck or wrist.

Most of the household vessels were of clay, and of such there was a great variety of shapes corresponding to their various uses, though if one may judge from the practice of the modern Arab these fine distinctions were little observed in practice. All were absolutely plain, the painted pottery of the prehistoric period having long since fallen out of use, and all except the largest and coarsest store-jars were made on the potter's wheel. Handles were practically unknown, but for certain shapes of pots there were clay lids, and store-jars would have stoppers of wood, or else have a cloth cover tied over the mouth



MOST IMPOSING OF THE SCULPTURED MONUMENTS ERECTED BY A SUMERIAN KING:

Within the ruins of a temple at Ur known as Dublal-Makh were discovered the fragments of a stele set up by Ur-Engur, founder of the Third Dynasty of Ur and of a Sumerian empire. When complete it was a limestone slab nearly 16½ feet high and 5 feet wide, carved in bands on both sides—the largest and the most important monument of such antiquity found in Babylonia. The best preserved band, partly restored, is here shown divided between this and the opposite page.

Courtesy of the Joint Expedition to Ur

with clay plastered over the cloth and marked with the owner's seal.

In the wealthier houses there would be a few small vases, drinking-cups or bowls, made of glazed frit with designs in white and yellow on a blue ground; more common were vessels in metal or in stone, open bowls for the most part, which for ordinary use were of copper or of white limestone, diorite or shale. But here luxury had a wider scope and we find beautifully fashioned vases of soapstone, granite, coral-limestone and calcite ("alabaster"), sometimes decorated with carved reliefs, processions of human figures, battle-subjects and animals; the effect of the carving might be enhanced by inlay in mother-of-pearl, shell or lapis lazuli, while



HOW BABYLONIANS SIGNED THEIR DOCUMENTS

To the Babylonian his seal was what a man's signature is to-day. It took the form of an engraved cylinder which, when rolled over a tablet, left on the wet clay an impression of the owner's emblem—usually a group of gods, as in this impression from the seal of Adda the scribe (c. 2500 B.C.)

British Museum

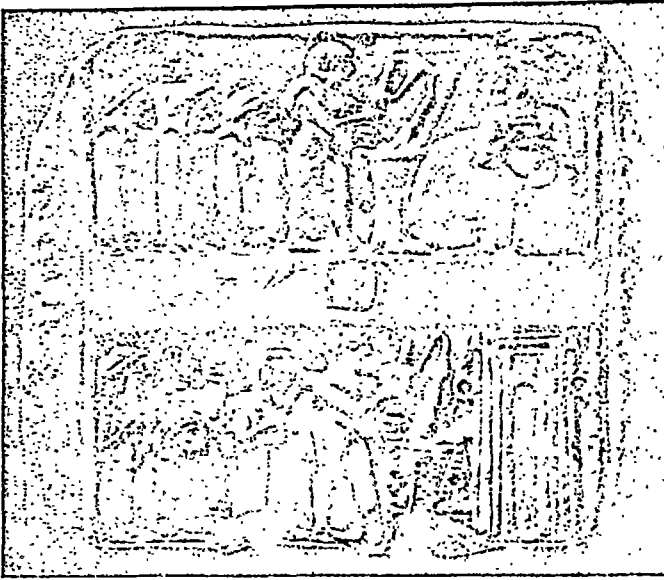
the silver vase of King Entemena, engraved with heraldic eagles, lions, stags and goats (now preserved in the Louvre) illustrates the treasures of the goldsmith's art which adorned the royal table. Indeed, there is plenty to show that if the organization of society had been developed to a pitch



PART OF THE TABLET RECORDING UR-ENGUR'S BUILDING OF UR'S TEMPLE-TOWER

In the half on this page Ur-Engur, introduced by a minor goddess, comes before Nannar the moon god on his throne and pours a libation into a vase containing date clusters and a branch; on the left the ritual is repeated before Nin-Gal, wife of Nannar. Almost certainly (to judge from other fragments) the scene represents the king receiving his divine instructions to build the mighty ziggurat of Ur shown in page 510; note that Nannar is holding measuring rod, cord and adze

Courtesy of the Joint Expedition to Ur



TYPE OF NASCENT ART IN SUMERIA

For the history of the development of Sumerian art a limestone plaque discovered in the Gig-Par-Ku temple at Ur is important. It shows scenes of sacrifice to the moon god Nannar, and its style dates it back to the period of Ur-Nina and his contemporary reliefs at Lagash, about 3000 B.C.

Courtesy of the Joint Expedition to Ur

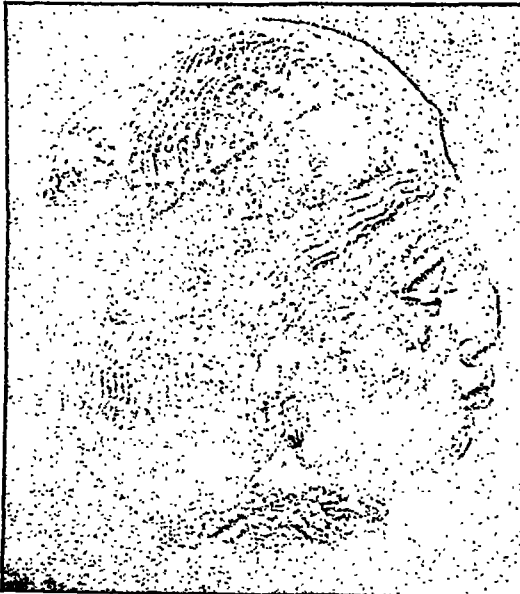
unequaled except in modern times, its amenities, too, were not to be despised.

By 2000 B.C. the art of sculpture had had a long history, and after passing from

the realism of the First Dynasty friezes on the Tell el-Obeid temple, through the phase of the Ur-Nina and kindred reliefs wherein we can discern the gradual development of a national style under a crudity at first sight more primitive but in reality full of vigorous effort, had reached its maturity in the spacious days of the Third Dynasty of Ur. From the ruins of that city have been unearthed masterpieces of sculpture which more than fulfil the promise given by the statues fashioned for Gudea of Lagash a hundred years earlier: the great stele of Ur-Engur, the marble head of Nin-Gal with its inlaid eyes of lapis lazuli and shell, the diorite head of the same goddess—these are the products of a finished art

such as need not fear comparison with the finest work of Egypt.

In other arts, too, the Sumerians of this period were far advanced. It is true that



SPLENDID CLIMAX OF SUMERIAN SCULPTURE IN THE ROUND

The relief at the top of the page may seem crude, but it contains all the seeds of the splendid art that flowered in the days of the Third Dynasty of Ur six hundred years later. Together with Ur-Engur's masterpiece in the preceding page, these two heads of the goddess Nin-Gal may be taken as typical; that on the left is of black diorite, that on the right of white marble with the eyes inlaid in blue lapis and white shell, giving an uncannily lifelike effect.

Courtesy of the Joint Expedition to Ur



TEMPLE OFFICIAL FROM EL-OBEID

The statue of Kur-lil, 'Keeper of the Granary of the Temple of Erech,' takes us back to Tell el-Obeid, and suggests by comparison of style that the First Ur Dynasty cannot have long preceded the earliest Lagash sculptures.

British Museum

the vast bulk of the written documents which have come down to us are of a non-literary sort, business records, letters, legal decisions, contracts and so on; but a people who wrote so much must needs have had a literature of their own, and some idea of what this was like we can gather from the surviving tablets. Almost all are of a religious nature.

First in importance are the legends of the creation of the world and of the Flood—legends which are in essence those of the first chapters of Genesis—the whole epic of the hero Gilgamesh whereof the Flood story forms a part (see Chap. 18), and the myth of Etana, who was carried up to heaven by an eagle; then there are poems on the problem of good and evil which read like the Book of Job, and hymns or psalms, composed for the temple services, lamentations and poems on the great cities. Even the historical inscriptions of the kings sometimes assume the language of poetry. There is no rhyme; the poem is composed in verses

each of which consists of two couplets having the same form and expressing kindred ideas; this is the structure of the Hebrew poems, and it can be detected even in the English version of the Book of Psalms, for instance, with which in substance as well as in metre many of the Sumerian hymns might be compared.

The hymns were intended to be sung to music; of this nothing has survived, or at least, if the signs against the words in certain tablets are marks of notation, they cannot yet be properly understood. But we know that a variety of musical instruments, flute and trumpet, large and small harp, lyre, drum and tambourine and cymbals, were in use, and that in the



GODDESS ENTHRONED ON GEESE

On grounds of style one is inclined to assign this statue of Bau—still rather squat and heavy—to the period immediately before the Third Ur Dynasty. Bau was the patron-goddess of poultry-farmers; geese here support her throne.

Courtesy of the Joint Expedition to Ur



GUDEA IN ROBES OF STATE

A seated statue of Gudea appears in page 433; this is remarkable, apart from its greater artistic excellence, as being the only standing figure from his remote period in such perfect preservation. Note the fringed robe draped over the left shoulder and the turban-like hat.

Ny Carlsberg Museum, Copenhagen

temples there were separate chambers where the priestesses gave instruction in music to the girls who were taking it up as a profession.

Even in the minor arts we can see the high standard of the age. The little moulded clay figures of gods and their worshippers—the 'teraphim' of the Old Testament—which are very common under the Third Dynasty, show a variety of subject and a freedom of treatment which are unknown later, and the modelling is sometimes quite masterly. Most of these figures are religious, but some—clay rattles, miniature vases, chairs and tables, little animals and so on—may be children's toys. They look like them, and we know that games were common then as now: children tossed knuckle-bones as they do to-day, there was a draught game, the squares generally scratched on a brick, and another game more like 'fox and geese,' played with counters and dice. For the elders there

was hunting in the desert and in the marsh, dancing, and at certain times of the year miracle-plays performed in the temples.

Perhaps the best proof that Sumerian civilization was not merely well organized materialism but had a moral value of its own is given by the position it accorded to women. The betrothal gifts, it is true, which the future husband had to make to his prospective father-in-law originated with a system of marriage by purchase; but that custom had long died out. Though the husband was still legal head of his house and possessed certain rights over his wife which offend our sense of decency—in payment of debt, for instance, he could hand her over to the creditor for a maximum space of three years, just as he could his child, yet the wife was by no means the chattel which Oriental society has so often made her.

Monogamy was the law, though if the wife were barren the man could take a second wife; but she would have a status inferior to that of the first. Or he could divorce her, giving her her dowry and in addition to it a sum of money propor-



GODS OF THE HOMESTEAD

Religion was a very personal affair in Babylonia. In *Genesis* we read that Rachel stole the images or 'teraphim' of Laban, and just such intimate little household gods, well modelled in clay, are found in great numbers on the site of Ur.

Courtesy of the Joint Expedition to Ur



It is interesting that the most ancient Sumerian statuettes which we possess came from Ashur, unknown historically at this early date, but later the capital of Semitic Assyria; these two on the left wear a linen garment flounced to imitate a sheep's fleece, the bearded man from the waist, the woman with elaborate coiffure from the shoulder. The flounces of looped threads have been reduced to one in the statue from Ur on the right, roughly of the time of Sargon of Agade.



This page not only illustrates the engaging quality of early Sumerian sculpture, but shows the styles of dress then prevalent in Mesopotamia. Both these are from Lagash; the unnamed royal personage on the left, of the earlier Ur-Nina period, is wearing the plain cloak reaching from left shoulder to feet, while the woman in attitude of prayer displays the more elaborate female attire, with woven bands, that had come in by the time of Gudea. She wears a metal necklace.

HOW MEN AND WOMEN WERE CLOTHED IN THE EARLY DAYS OF SUMERIA

British Museum and the Louvre

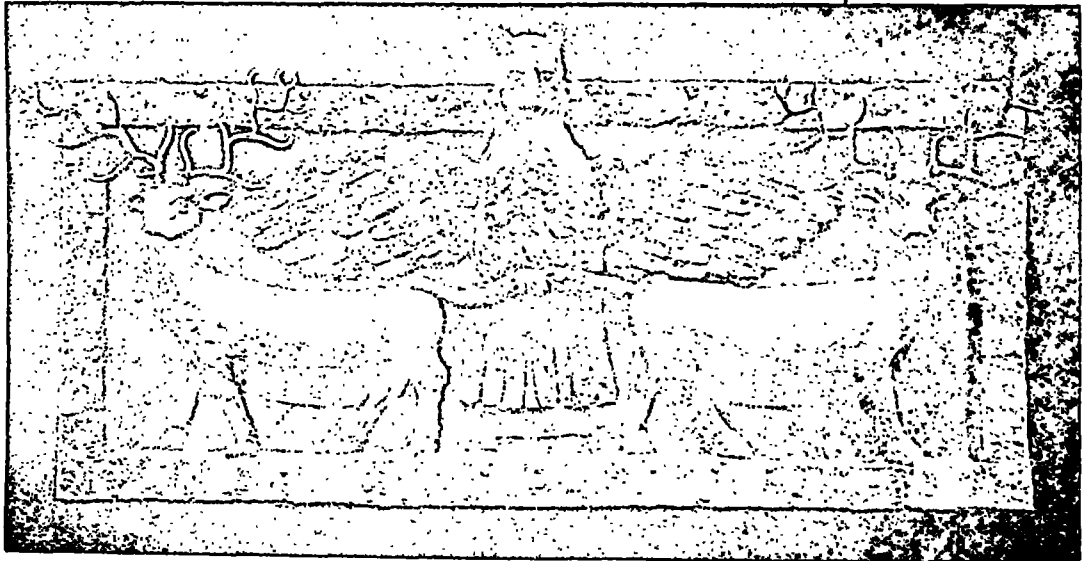
tionate to his rank, or again she might give him one of her slaves to be his concubine, as Sarai gave Hagar to Abraham, the concubine acquiring her freedom as soon as she bore a child, though her old mistress could reduce her to slavery again if she attempted to become in any way her rival. Certainly divorce was easy for the man, but if there was no fault on the woman's side she retained her dowry, enjoying the custody of her children, received from her husband's estate a maintenance grant for their benefit, and after they had reached their majority was free to marry again if she wished.

If neglected by her husband, a good wife might legally return to her father's house with her property; if deserted, she might resume her freedom and remarry at pleasure. She was mistress of her own estate: the dowry which she brought to her husband's house was her own till her death and then descended to her children, or failing them went to her father's family, not to her husband. She could embark on business and buy and sell without her husband's permission, could take out a licence for dealing in spirituous liquors, could give evidence in the law-

courts; and if she married a slave, not only did she retain her freedom but her children also were free.

The religious life also was open to women; they could become professional musicians or the like, or they could enter convents, taking vows of chastity—and the post of head of a convent was considered worthy of a king's daughter. Others might join the ranks of the religious prostitutes, and this was no degraded calling, for it really meant that a woman attached herself to the service of god's house and made to him the most costly sacrifice in her power, that of her own body; such devotees, for instance, enjoyed special rights of property and were free to marry at the end of their term of service.

Under the Third Dynasty of Ur the civilization of Sumeria reached its high-water mark. Materially it was unequalled by anything that was to follow it until such time as European culture invaded Asia; socially its organization was never afterwards surpassed in the Near East. Its moral ideals were proportionately less developed, yet out of them on alien soil, and among a strange people, were to grow the Law and the Prophets.



TRIUMPH IN COPPER FROM ONE OF SUMERIA'S MOST ANCIENT BUILDINGS

Over the porch of the temple at Tell el-Obeid, restored in colour facing page 528—or so one judges from the position in which it was found—once stood this heraldic copper-covered relief of Imgig (see page 535) grasping two stags by the tail. Much of the copper had rusted to mere flakes, but from a photograph taken as it lay undisturbed it has been possible thus to reconstruct the portions at present missing. It represents the high-water mark of Mesopotamian art in these prehistoric times.

British Museum

LIFE IN EGYPT DURING THE MIDDLE KINGDOM

A Glimpse of the Egyptian at Work and Play
under the Pharaohs of the Twelfth Dynasty

By T. ERIC PEET

Brunner Professor of Egyptology in the University of Liverpool ; Author of *Egypt and the Old Testament*, *The Mayer Papyri*, etc.

THE Middle Kingdom, consisting in its strictest interpretation of the Twelfth Dynasty, 2000 to about 1788 B.C., is generally described as the Feudal Age. By this it is meant that the structure of society during that period is similar to that of feudal Europe in the Middle Ages. At the head of the state stands the king, still in theory the source of all power, the chief priest of all the gods and the sole lawgiver. But under him are the various local chiefs, dependent on him for the tenure of their land and owing him allegiance, but enjoying almost complete freedom each in his own district or nome. We must not, however, over-emphasise the difference between these conditions and those prevailing under the Old Kingdom: it was one of quantity rather than of kind, and it was essentially the product of historical events.

At the end of the Sixth Dynasty the Egyptian state had fallen into confusion, probably through the failure of the kings to control the powerful nobles. The situation had been complicated by an Asiatic invasion of the Delta. The history of these years is dark to us, and when light begins to dawn we find reigning at Heracleopolis in Middle Egypt a family of princes which Manetho has recorded as forming the Ninth and Tenth Dynasties. In the south, at Thebes, is another family ruling as the Eleventh Dynasty, but probably contemporary, in part at least, with the Heracleopolitans. There must have been a definite struggle between these two houses, though only slight traces of it remain, and the south was ultimately victorious.

When the Thebans of the Twelfth Dynasty came to the throne they were

faced with a situation very different from that which had presented itself to Menes when he unified the two kingdoms. During the years of chaos local chieftains had again strongly asserted themselves, and those of the Hare Nome were powerful enough to quarry alabaster at Hatnub, previously a royal privilege, and to date their commemorative inscriptions there by the years of their own reign. The early kings of the new dynasty might unite these scattered forces but they could not crush them. They therefore accepted a compromise; they asked allegiance, but allowed, or at least did not disallow, considerable local independence.

It was not until the reign of Senusret III that the Thebans felt themselves in a position to subdue their turbulent vassals. The sudden and complete cessation of the magnificent series of rock-tombs of the nobles at El-Bersheh, Beni Hasan and Mer in this reign admits of no other explanation. Later, in this same dynasty, under Amenemhet IV, the local chiefs seem to have reasserted themselves, and the result was once more internal disorder and invasion by Asiatics, the Hyksos.

Under this feudal system the power of the nomarch in his own nome was almost supreme. It was clear, however, that nominally at least the nomarchate whenever it fell vacant was in the gift of the Pharaoh, though it would probably be very difficult for him to deny the legitimate claim of the legal heir. A 'baron' of Asyut (Assiut) who made a number of contracts with the priests of the local temple for future offerings to him in his tomb draws

the most careful distinction between 'his paternal inheritance,' of which he disposes unreservedly even for the future, and his property held by virtue of his office as 'baron,' of which after his death he is powerless to dispose. As in the Old Kingdom, the crown still possessed financial rights in every district and taxes were collected by officials of the central treasury.

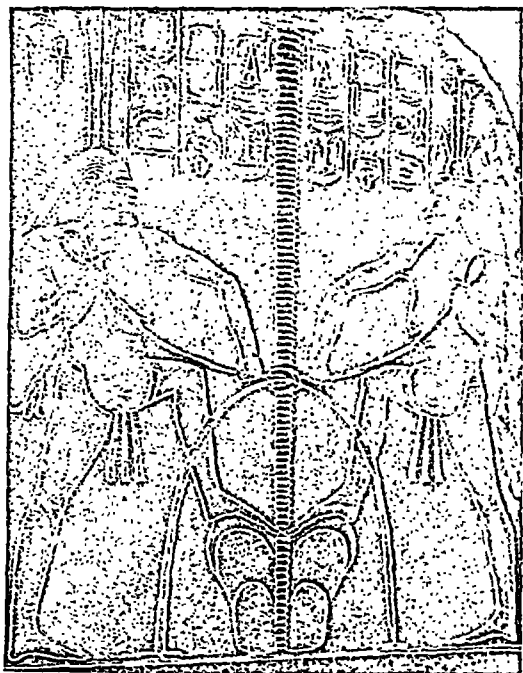
The vizier served as the king's chief minister in all matters, both administrative and judicial. Of the actual methods by which justice was administered we know no more than under the Old Kingdom. We cannot even say to what extent a body of law existed dealing with criminal offences, but we are better informed about civil law, for even as early as the reign of Sneferu of the Third Dynasty we find, in the inscription of Methen, a complicated series of bequests which testifies to the advanced condition in which the law of property must then have been. Under the Fifth Dynasty we have several tomb inscriptions recording bequests of land,

mainly in consideration of funerary services to be performed by the legatee for the testator; and among the papyri found at Illahun, or El-Lahun, are a number of contracts, conveyances and wills drawn up in such stilted and conventional phraseology that they can only be the work of a body of professional lawyers, though these enjoyed perhaps no more definite title than that of scribe ('sesh').

The most remarkable document of all, however, is the tomb inscription of Hapzefa, baron of Asyut, which has been mentioned above. In it, as head of the priestly staff of the temple of Upwawet, the local god of Asyut, he makes a series of ten contracts with the staff, renouncing certain present shares in the temple-offerings in return for services to be performed for him by the priests after his death. Here we find the legal distinction between a person in his individual or private capacity and the same person in his capacity as an official. One of the contracts is actually made between the baron himself as an individual and the chief priest of Upwawet as an official, though at the time of the contract this official was none other than Hapzefa himself.

Such testamentary enactments as these show that the law of property not only existed but was respected in Egypt under the Middle Kingdom. It is hardly likely that criminal law was much less fully developed, and we may hazard the guess that the forty rolls of the law which were spread before the vizier in his court in the Eighteenth Dynasty already existed in some form in the Twelfth.

How far does this very advanced legal system reflect an ethical code, and how far had this latter, if it existed, a religious background? These are questions which are not easy to answer. The very incomplete picture which we possess of Egyptian religion under the Old and Middle Kingdoms represents it as a somewhat formal and impersonal affair. The sun-god Ra, who came into full prominence at about the beginning of the Fifth Dynasty, and was combined with the falcon god Horus in the form 'Ra-Horus-of-the-horizon,' had suffered a further syncretisation when the Thebans came to power,



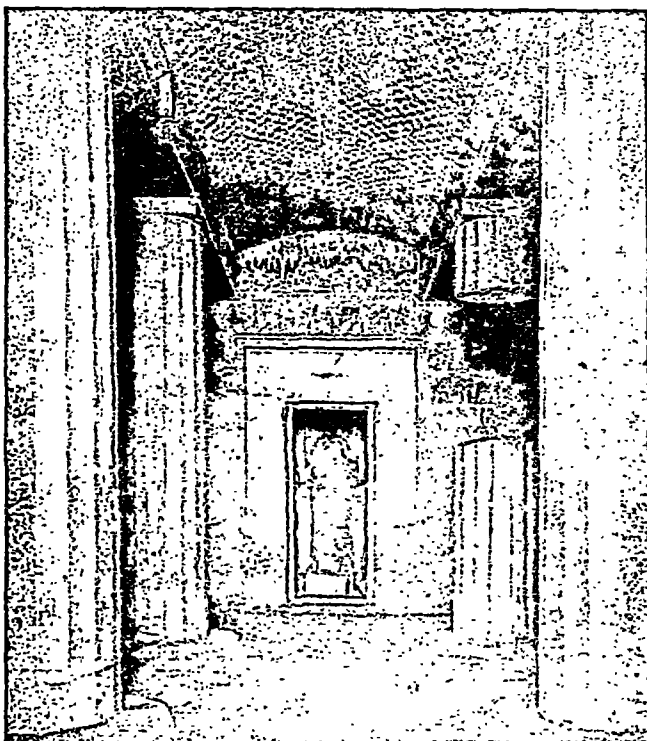
EGYPTIAN UNITY SYMBOLISED

Dating from the reign of Senusret I, this carving of the feminine-breasted gods of the North and South Nile binding together Upper and Lower Egypt with their emblems, the papyrus and lotus, represents the work of consolidation accomplished by the Twelfth Dynasty kings

Berlin Museum

for he was then combined with Amen, the previously obscure god of Thebes, as Amen-Ra. He it was who now ruled the fortunes of Egypt.

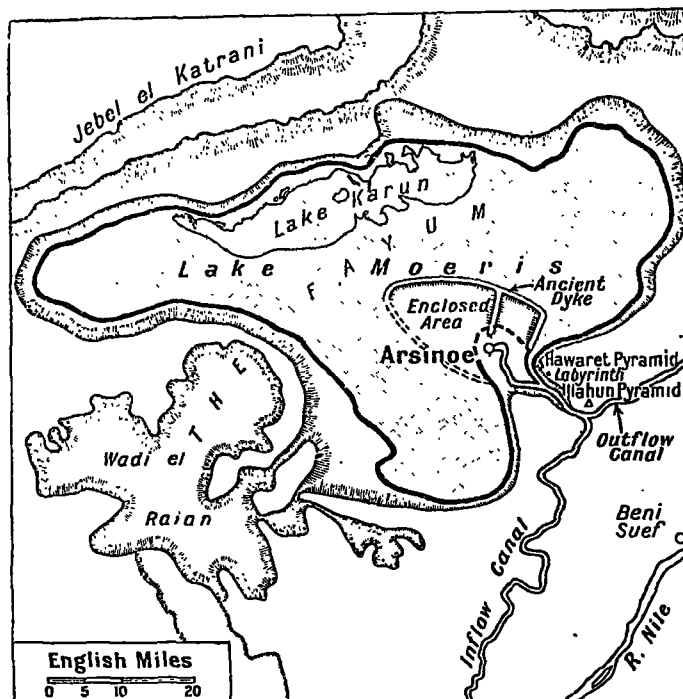
But to the ordinary Egyptian he was doubtless a very shadowy and distant figure, and the religious interest of the ordinary citizen, in so far as he had any, centred in the deity of his native town or district. Even here religion seems to have been a matter of observance and ritual rather than of conscience, and the boastful autobiographies inscribed by the nobles in their tombs seldom or never refer to the doing of right for its own sake, or because the gods demand it. The didactic papyri give the same impression, and where honesty is inculcated the reason given for



IMPORTANCE OF GREAT NOBLES EXPRESSED IN THEIR BURIAL PLACES

Before Senusret III asserted the supremacy of the royal government, the feudal nomarchs ('barons') acted as petty kings within their own nomes. Emblematic of their independence are the magnificent tombs that they had constructed in imitation of royalty; above we see the fane-like interior of that built by the nomarch Ameni at Beni Hasan and the impressive entrance of another noble's rock-tomb at Mer. This ostentatious practice came to an abrupt end in Senusret III's reign.

Upper photo, Sir Flinders Petrie; lower from Blackman, Rock Tombs of Meir



AMENEMHET'S VAST IRRIGATION SCHEME

The low-lying plain of the Fayum was at one time flooded yearly by the Nile, with which it is connected by a narrow channel only. Amenemhet III (1849-1801 B.C.) is believed to have devised means of regulating the outflow for irrigation, and to have reclaimed a large tract of land for agriculture.

Modified from R. H. Brown, The Fayum and Lake Moeris

of a moral conscience does it not look as if magic quickly supplied an anaesthetic where-with this disturbing member might be lulled to sleep again? These are questions which the paucity of material makes it very difficult to answer: it is hard enough to settle such problems in the case of a living nation; in the case of a dead people it is often impossible.

An easier task confronts us when we turn from the moral to the material side of Egyptian life. Here in some respects, though the general conditions of life remain the same as in the Old Kingdom, it is possible to chronicle an advance. There were two reasons for this: first, the development of foreign trade, and secondly the transference of the national labour from the useless task of building pyramids to the profitable one of improving the irrigation

practising it is generally merely that 'it pays.'

At the same time we can trace in the Middle Kingdom the beginnings of a moral standard and a belief in judgement in the hereafter. This is in part connected with the increasing popularity of Osiris, who, in the Middle Kingdom, is now domiciled at Abydos as god of the dead. In the inscriptions on the coffins of this period we find the first references to this god as a judge of good and evil, an idea which was to reach its full development only in the New Kingdom, but as yet there is no sign of the formal catalogue of sins which, in the New Kingdom, the dead man is made to repudiate in the 'Negative Confession.'

But how far was this fear of a judgement effective? Is it not probable that, as in the New Kingdom, so in the Middle, the magic spells buried with the dead, be it on his coffin, be it on a roll of papyrus, were regarded as a sufficient protection against the possible consequences of a vicious life? And if we suppose that the evolution of the idea of judgement marks the awakening

system of the country. The first of these reasons may more suitably be discussed a little later. Of the second a word is necessary here. The oasis of the Fayum, which lay immediately west of Middle Egypt, formed a depression below sea level which was flooded each year by the Nile. The kings of the Twelfth Dynasty conceived the idea of controlling the inflow and outflow in such a way as to collect large quantities of water during the flood time and release them gradually, and as required, during the low Nile season. The Irrigation works idea was similar to that of by Egypt's kings the modern dam at Aswan.

To which of the kings the conception or the execution of this project was due is not altogether certain, though tradition associated it with the name of Amenemhet III. The scheme included the reclaiming of a very large area of flooded land at the entrance to the Fayum by means of a vast wall. The effects of these improved conditions soon made themselves visible in the increased prosperity of the country.

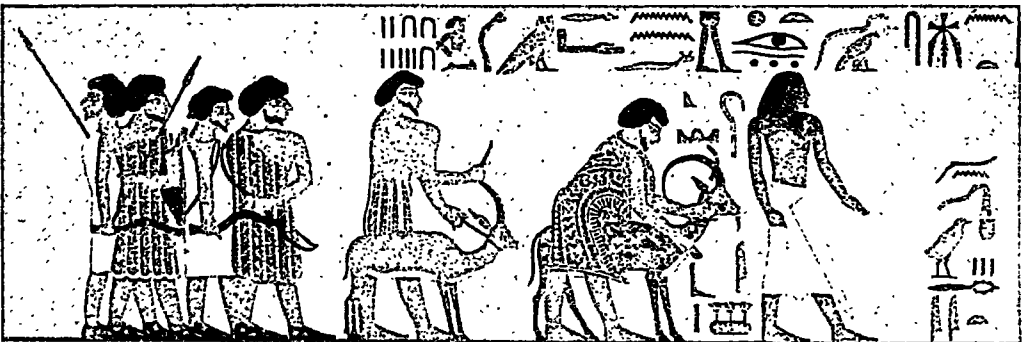
The position of the serfs was doubtless much the same as it had been under the Old Kingdom; indeed it hardly changed throughout the whole of Egyptian history. The noble, however, led a life of luxury and enjoyment, combined in some cases, that is if we may place any credence in the tomb inscriptions, with genuine care and thoughtfulness for those under his authority.

He gave bread to the hungry, clothes to the naked, he ferried across the Nile those who had no boat. In times of stress he ensured the corn supply of his district, and we will hope that his claim never to have robbed the widow or despoiled the orphan was something more than the pious iteration of a hackneyed tomb formula. He took his pleasure hunting on foot such game as still inhabited the desert, or in his frail papyrus canoe on the marshes, spearing fish with the harpoon or bringing down wild duck with his throw-stick.

The emergence of a numerous middle class is one of the main social features of the Middle Kingdom. This development

is to be attributed to improved conditions in general, and more particularly to the increase in foreign trade. The middle class is strongly represented among the tombs of Abydos, where every good Egyptian wished to be buried near the great god Osiris. Should this be impracticable or inadvisable he at least made a pilgrimage there, or directed that his mummy should be conveyed thither before being finally laid to rest in a tomb in or near his own town.

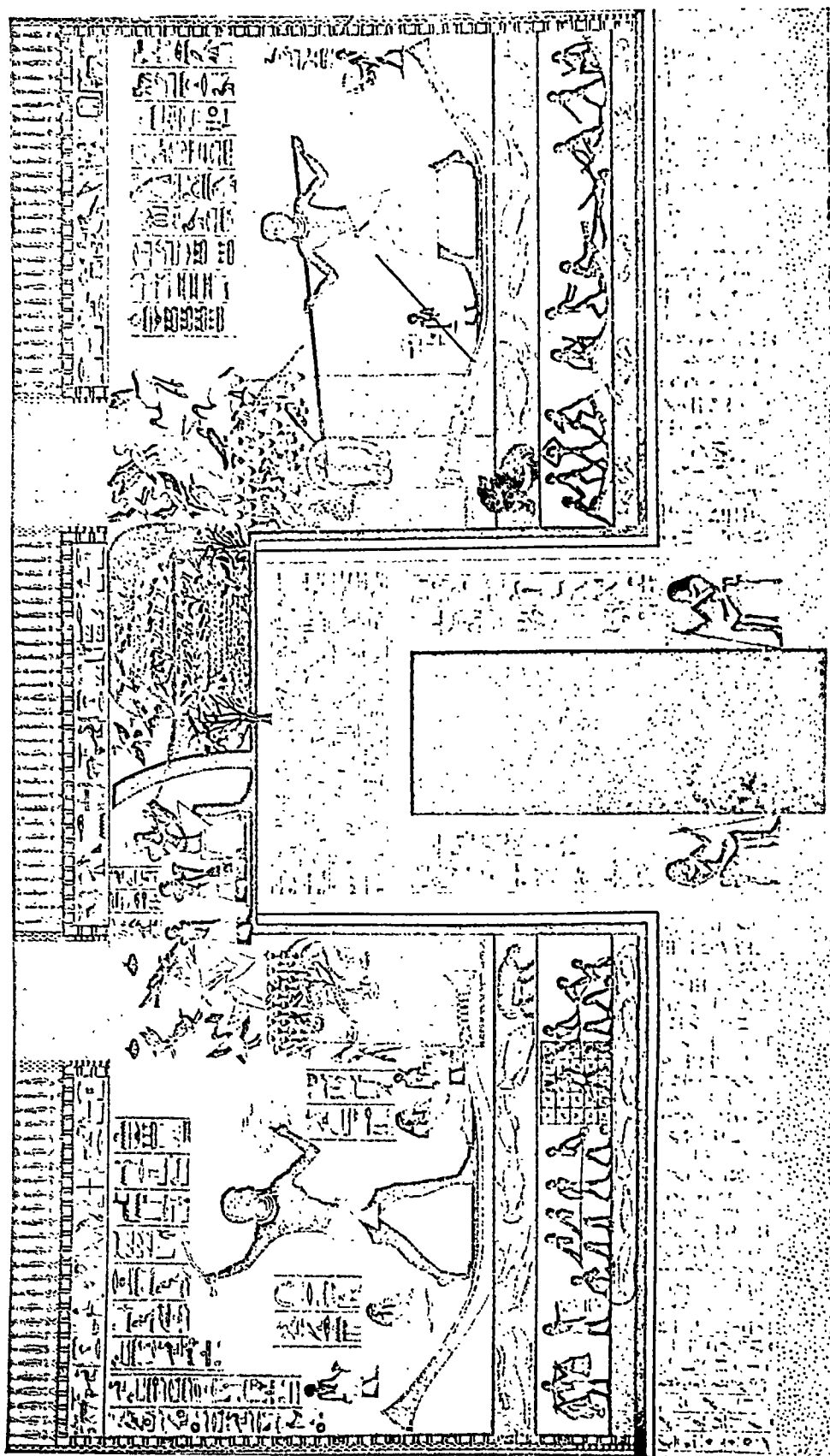
Foreign conquest brought about other changes in society. The foreign slave became an institution. He generally seems to have been a Syrian, though there must have been Nubians too, and the word for Syrian, 'Aaim,' becomes almost a synonym for slave at the time of the Twelfth Dynasty. Such slaves were not always attached to private individuals. More frequently we find them in the service of the temples, to which they were allotted as the gods' share of war booty. The temples, however, received not only slaves but cattle, grain and treasure of every



BEDUINS ARRIVE FROM THE DESERT WITH GIFTS FOR A NOBLEMAN

By the Twelfth Dynasty numbers of foreigners were coming into Egypt—many of them captives, brought as slaves. The majority of immigrants, free and unfree, were Syrians; as are the members of this party, depicted on the walls of a tomb at Beni Hasan. Led by their prince, or sheikh, who himself brings a gazelle, they prepare to lay their offerings of kohl before Khnumhotep, prince of Menat-Khufu and Administrator of the Eastern Desert, who held office during Senusret II's reign.

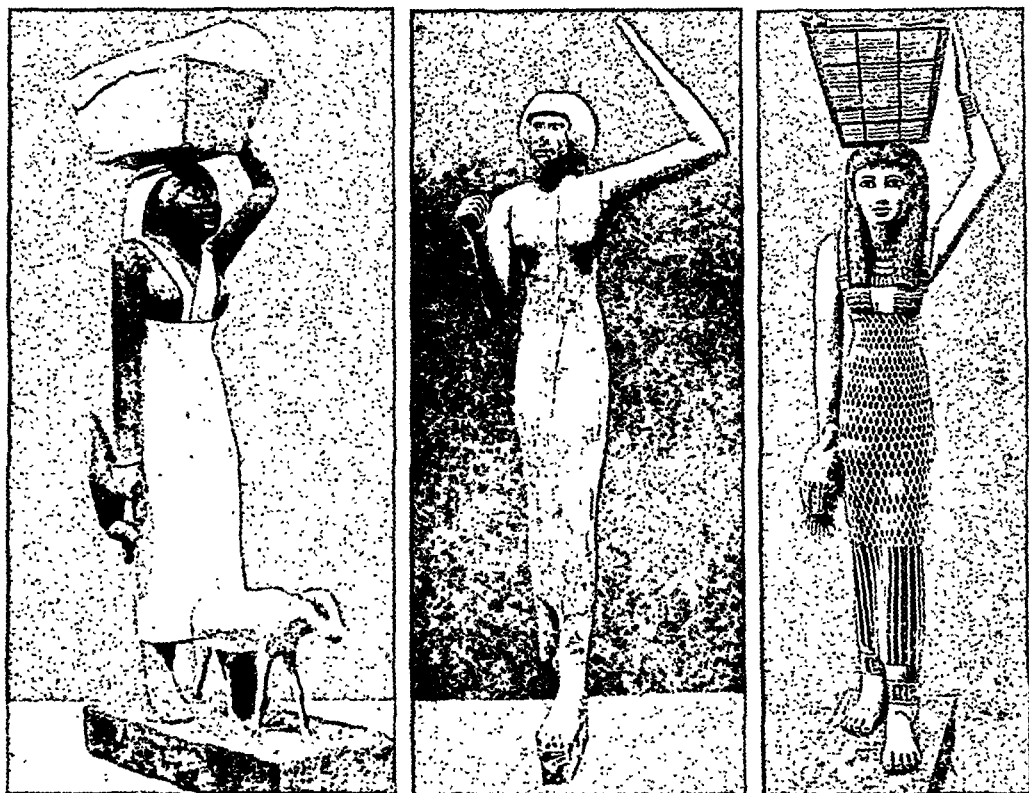
After Lepsius, Denkmäler



POWERFUL LOCAL ADMINISTRATOR FINDS RECREATION IN THE TRADITIONAL SPORTS OF THE NOBILITY

Provincial governors in the Middle Kingdom seem on the whole to have been both enlightened and genuinely interested in the welfare of the people. Their official cares, however, were not sufficient to keep them from the chase, from fowling and fishing. As in an earlier age (see pages 484-5) the boomerang and harpoon were still the favourite implements. The costume even of a great man—prince Khnumhotep is represented in the above panels—was scanty; the false beard that he is shown wearing was probably an artistic convention. His wife, shown on a much smaller scale, goes fowling with him.

From Lepsius, Denkmäler



MODELS OF NOBLES' SERVANTS THAT HAD A RITUAL PURPOSE

In the tombs of great men it was customary to place statuettes of attendants whose souls were supposed to serve their lord in the Other World. They are usually very realistic, and afford us intimate information as to society in the Middle Kingdom. Above we see three such servants: one of negroid type, evidently an outdoor worker; an Eleventh Dynasty servant from Deir el-Bahri; and a noble's hand-maiden from the tomb of Mehenkwtetre.

Courtesy of Sir Flinders Petrie, Egypt Exploration Society and Metropolitan Museum, New York

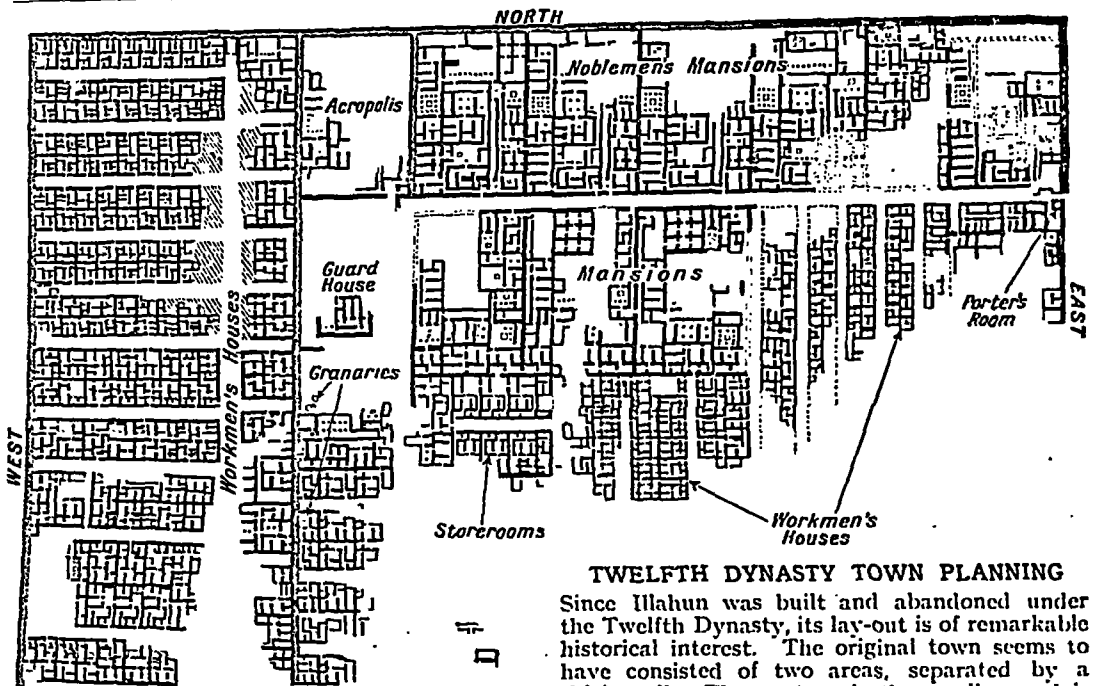
kind from these foreign expeditions. This led naturally to a great expansion in the numbers and wealth of the priesthood, and in this way were laid the foundations of a power which a thousand years later was to oust the Pharaohs themselves from their throne.

The position of women in this society was by no means a low one. The house, however, was the woman's domain—a common title for women is 'nebt per,' mistress of a house—and in paintings she is represented as of a light yellow colour in contrast to the men who, as living mainly out of doors in the sun, are represented as being dark, reddish brown. Hers are the indoor tasks such as baking, brewing, spinning and weaving, though men occasionally share them all. As a wife she is 'the beloved' of her lord; she is shown in tomb scenes sitting with her arm round his neck, or accompanying

him on his pleasure expeditions in the marshes, though on these occasions she is usually drawn on a smaller scale, perhaps only because she takes a less active part in the sport.

Of the formalities which accompanied the celebration of a marriage we know nothing whatsoever. Normally a man had but one wife, but there are numerous cases of husbands who had two or more, and it is clear that the law did not forbid polygamy. The wise Ptahhotep says: 'If you are a man of position set up a house [the common phrase for 'to marry'] and love thy wife in the house as is seemly. Fill her belly and clothe her back. Delight her heart so long as she lives.'

It is often stated that the Egyptian kings married their sisters. The Ptolemies certainly did, and there are earlier instances, but there is no evidence to show that this was a general practice. The fact



TWELFTH DYNASTY TOWN PLANNING

Since Illahun was built and abandoned under the Twelfth Dynasty, its lay-out is of remarkable historical interest. The original town seems to have consisted of two areas, separated by a thick wall. The western is the smaller, and is crowded with small workmen's dwellings; the eastern contains the acropolis and great mansions.

From Sir Flinders Petrie, 'Illahun, Kahun and Gurob'

that in love poems the beloved one is always referred to as 'my sister' is thought by some to indicate at least a tradition of sister marriage, but this must be regarded as quite doubtful, for the phrase may in these cases be merely a natural term of endearment. Similarly some believe that inheritance passed through the eldest daughter, but the instances brought forward to prove this seem only to show that if a man's sons died without heir the line then reverted to his daughter and her issue.

Women played an important if subordinate part in the priesthood. The musical side of the divine service in the worship not only of female but also of male deities was chiefly in their hands. Under the New Kingdom these musician-priestesses seem to have formed a harem of concubines of the god Amen-Ra, and the chief of them was known as the God's Wife. There is some reason to suppose that this state of things already existed under the Middle Kingdom.

The details of domestic life are well known to us, mainly from the paintings in the tombs. Of the ordinary house, however, little is known, for no houses of the Middle or Old Kingdom have survived

except those of a small town specially built at Illahun for the workmen engaged on the pyramid of Senusret II. Most of these are mere workmen's cottages, but the few larger houses belonging to the overseers differ surprisingly from the New Kingdom houses so well known to us from Tell el-Amarna. In both cases the material is the same, namely mud brick and wood. In both cases, too, the central feature of the building is a hall with a roof supported on columns, lit by windows high up in the walls above the level of the roofs of the surrounding rooms. But while at Tell el-Amarna this central hall has a loggia half open to the sky both to north and to west of it, at Illahun it is preceded by a broad room the whole width of the house, and this again by a colonnaded court.

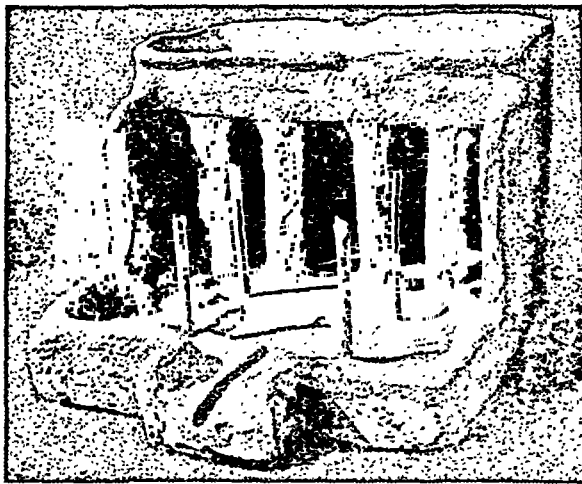
Let us try to picture the occupants of such a house. First there is the master. For ordinary occasions his costume will be a simple short kilt of fine linen reaching a little below the knees. At other times he may wear a longer skirt over this, reaching down to his ankles. In some cases this is to protect him against the cold and is of thicker material, but not

always, for often it is of such fine linen that the shorter kilt is clearly seen through it. A rarer garment, worn perhaps only on festive occasions, though more commonly by the king, is the hunting kilt, a short skirt of pleated linen: both sides are rounded in front, and between them hangs a projecting trapezoidal apron of the same material as that of which the kilt is made. On the master's feet, at any rate if he be out of doors, are sandals either of plaited rushes or of leather.

The mistress of the house is equally simply clothed in a plain linen shift,

reaching down from below the breasts to the ankles and supported over the shoulders by two straps of the same material. For more festive occasions this may be supplemented by a garment of similar shape worn over it, and consisting merely of a network of beads. The simplicity of clothing both of the master and the mistress is in strong contrast to the more complicated fashions of the New Kingdom, due perhaps to imitation of Syrians and other foreigners.

The master's hair was worn short or even close cropped, but on state occasions



SOUL-HOUSES THAT REPRODUCE ACTUAL ARCHITECTURAL FEATURES

Modelled for the dead, soul-houses afford us some idea of the structure of dwellings in the Old Kingdom. A courtyard seems to have been essential; note its tank (surrounded with poles for an awning) in the top right example and the models of offerings in another. The upper floor of a two-storey house was reached by stairs in the open air. The portico was a common feature, the majority having plain pillars, not lotus columns as in Mehenkwtet's luxurious home.

Upper photos: Petrie, 'Gizeh and Rifeh'; lower left, British Museum; lower right, Metropolitan Museum, New York

he would wear one of his wigs, consisting either of straight or of curly hair. His wife's hair hangs down in two plain tresses in front of her shoulders, but we need not necessarily assume that these are natural, for many representations show us ladies of rank as well as young girls and servants with quite short hair. The younger children of the house do not cumber themselves with clothing; the elder are clothed like their parents, boys in the short kilt, girls in the long shift. The former wear a long side-lock of hair, the latter a short tuft.

The household is not idle. In one room we shall find servants spinning flax with

the simple spindle and whorl still used in backward countries all over the world; others are busy at the loom, weaving on horizontal or vertical frames linen cloth of varying fineness. Great store was apparently set by the delicacy of this material, and some of the specimens which have come down to us compare favourably with the finest modern silks. Very little is known about the use of wool in the Old and Middle Kingdoms, though the heavy cloaks occasionally represented on statues or in paintings are clearly of this material.

In the kitchen, out of doors in the larger New Kingdom houses and perhaps already

so in earlier days, the preparation of food is in full swing. Corn is being brayed in a stone mortar with a large wooden pestle in order to release the husk and break up the grains. Women then grind it into flour with a pebble on a large flat stone (see page 498). Loaves of various shapes, made from spelt or barley, are being baked in cylindrical pottery or brick ovens, low and open in the Old Kingdom, tall and closed in later times.

The brewers are taking lightly baked cakes of barley, spelt or 'besha' grain, breaking them up in water, and forcing them, after fermentation, through fine sieves into large pots. Others are already bottling the liquor produced in tall two-handled jars.

Wine was probably made not in the kitchens but near to the vineyards. The grapes were carried in baskets and placed in a press, apparently a large flat stone with hollowed surface. Five or six men then trod them, holding on to ropes suspended from a cross-bar fixed above their heads. The wine was poured into vases set in place to receive it. Finally the trodden grapes were placed in a cloth



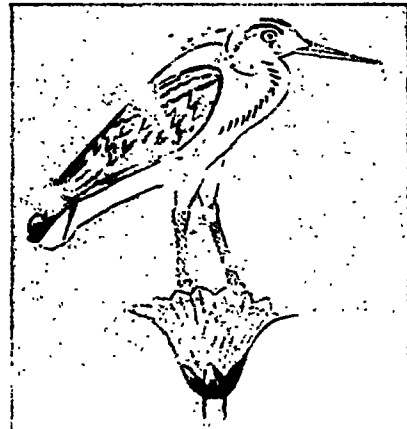
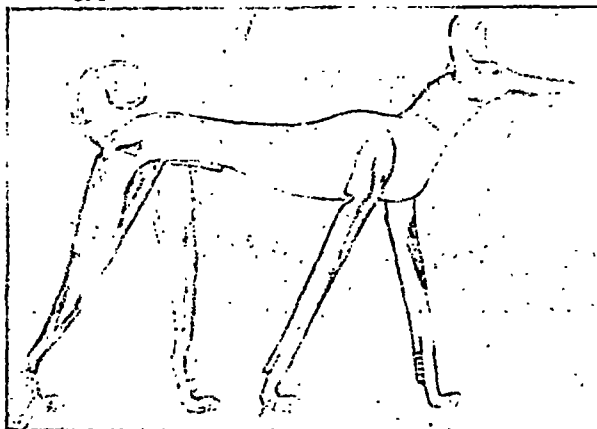
SIMPLE COSTUME OF A COURT OFFICIAL

The ordinary dress of a nobleman of the Middle Kingdom was a simple linen kilt, like that worn by Ameni, a warden of the palace, in this stele. Sometimes a skirt was worn in addition and on ceremonial occasions a wig was conventional; the wide collar was an ornament rather than a garment.

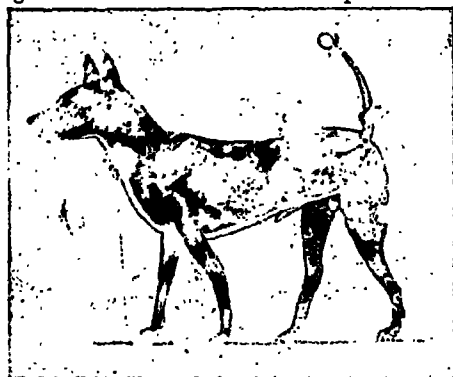
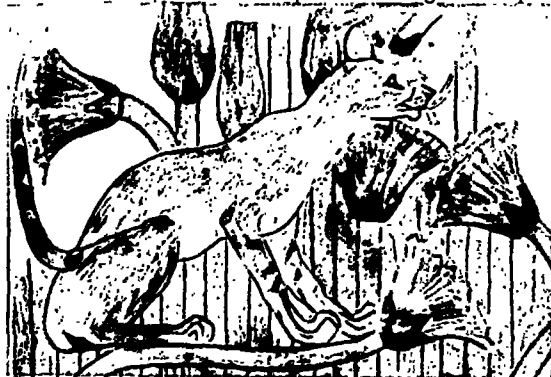
British Museum



In a flowering acacia bush in the tomb of Khnumhotep there sit a redstart, two shrikes and a dove, with ducks swimming in the water below. The ibis on a papyrus plant was a bird common in Egypt, and held to be sacred, though now it is seldom encountered north of the Sudan.



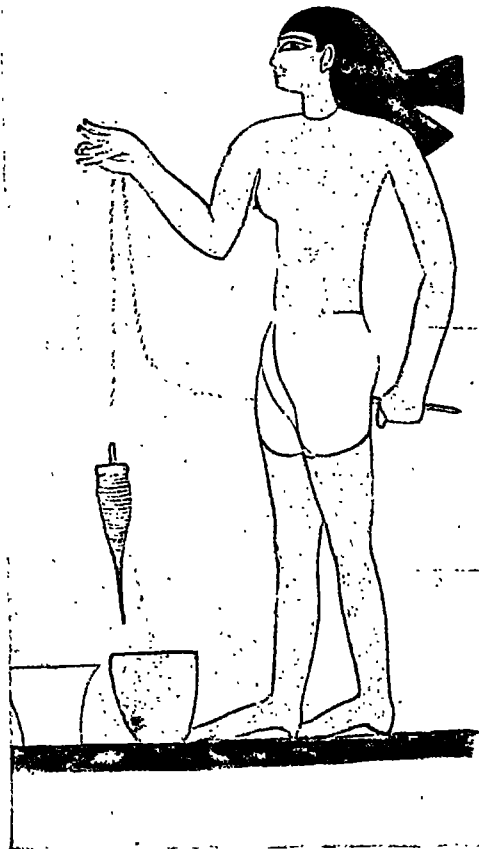
The dog on the left, of greyhound type, is probably the ancestor of the modern Nubian 'slughi' hound (see page 486); the bird is a species of heron. The first is in the tomb of Amenemhet, while the second forms part of the great harpooning scene in that of Khnumhotep.



It is in the Middle Kingdom tombs at Beni Hasan, belonging to powerful local barons, that Egyptian wall painting reaches in many ways its highest development; the truth and vitality of the group of animals in this page speak for themselves. Immediately above is a cat (probably domestic) that has climbed a papyrus stem, from the tomb of Khnumhotep; and on its right a grey-and-tan hound from the tomb of Khety. Its tail ends in a curious knob that may be an artificial production.

ANIMAL MASTERPIECES FROM MIDDLE KINGDOM EGYPTIAN FRESCOES

From drawings by Howard Carter in Newberry, 'Beni Hasan,' Egypt Exploration Society



The craftsmen (top) are performing an operation so like glass-blowing that the antiquity of this invention has been greatly exaggerated. Actually they are blowing a furnace with clay-tipped reeds. Their companion is a potter at his wheel. Below, a harpist, and left, a girl spinning.



The scenes in this page are all from the tombs of Amenemhet and Ikhnemhotep at Beni Hasan. Immediately above are three priests taking part in the great scene of offerings at the funeral of Amenemhet. The first, making an oblation of cold water, is a kind of chantry priest ('hen-ka,' servant of the 'ka'); the last is the lector ('kherheb') with his papyrus roll; while the central figure in the leopard skin is the 'sem,' a religious official of some importance.

BEAUTIFUL AND LASTING COLOURS USED BY THE EGYPTIAN TOMB PAINTER

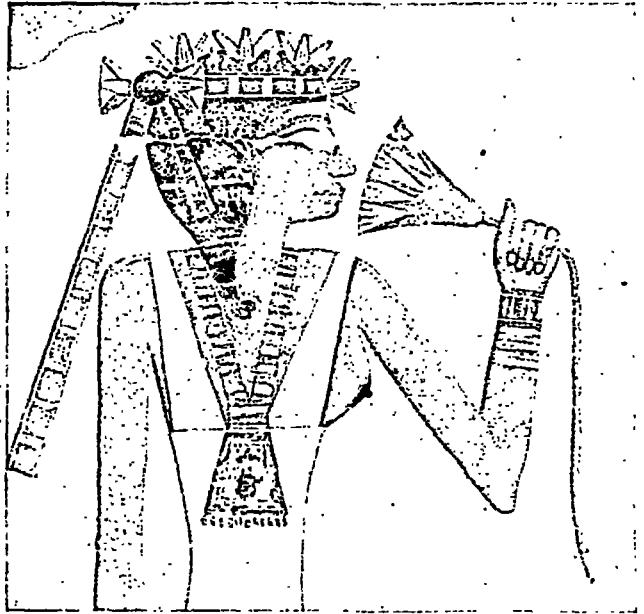
From Newberry, 'Beni Hasan,' Egypt Exploration Society

or sack, the two ends of which were then twisted in opposite directions by means of short poles held each by two men, and the last drops of the precious liquid were squeezed out and fell into a vase. The wine was then run off into jars, which were sealed each with a great cap of mud on which a cylinder seal or scarab impressed the name of the vineyard or of the official responsible for it.

The Egyptian believed that wine was meant to make him glad, and feasting occupied an important place in his programme. He would invite his neighbours to assist him 'to make a happy day.' We have representations of the guests, both male and female, sitting quietly watching the entertainment provided for their amusement, smelling at lotus flowers and drinking from the bowl as it is presented to them.

An orchestra consisting of a small harp and a pair of flutes provides the basis of the music, while singers accompany it, marking the time by clapping their hands. Dancers, male or female, in normal Egyptian dress, though occasionally with an unusual tuft or tress of hair, perform what appear to be fairly simple movements of the arms, legs and body. It should here be noted that music and the dance were not only forms of amusement in Egypt, but were largely used in the service of the gods and the dead.

Of other physical recreations wrestling was the most interesting, judging by the pictures which have survived. The system was one of catch-as-catch-can. We have one picture of women playing at ball, and several in which we see them performing acrobatic feats, more especially the backward somersault. If less energetic forms of amusement were demanded, there were the various games played with pieces and a board (see page 562). In one of the simplest and oldest of these the



ELEGANT PORTRAIT-STUDY OF A LADY

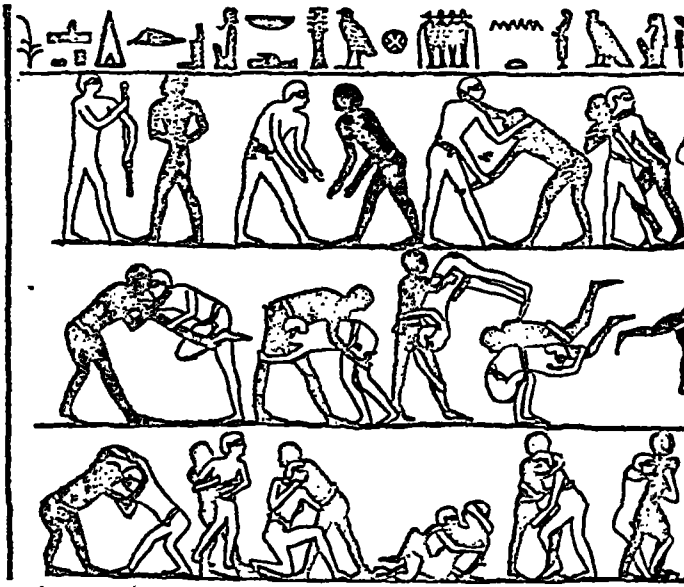
Daughter of a great man, this girl, with her elegance and refined features, is representative of the womenfolk of her class. A closely fitting linen gown such as she wears was the normal feminine costume. Her hair is not necessarily natural, since Egyptian women commonly wore wigs.

From Newberry and Fraser, 'El Bershek,' Egypt Exploration Society

board was marked with a design in the shape of a coiled snake. In others it was divided into squares, 24 or 30 in number, on which pieces were moved in accordance with rules unknown to us.

The origin of the arts and crafts of Egypt is lost in the mists of antiquity. The earliest of the predynastic people of whom we can learn anything at all are already expert potters, and use copper, if only in small quantities. More astonishing still, they have already learned how to coat the surface of various substances with a glaze, and to colour this with some salt of copper. These arts deserve detailed consideration.

The use of copper may possibly have been discovered in Egypt, owing to the accidental reduction in the fire of the malachite used for painting the eyelids. The earliest sources of the metal may have been the desert between Egypt and Nubia and the Red Sea, though some believe that malachite as well as turquoise was the object of the Egyptian expeditions to Sinai from the First Dynasty onward. Later supplies may have come from Syria



CATCH-AS-CATCH-CAN TO AMUSE A NOBLEMAN

Wrestling was one of the spectacles with which the Egyptian noble entertained himself. The pictures that survive give a spirited impression of this sport, but do not enable one to reconstruct any set of rules; possibly there were none.

From Newberry, 'Beni Hasan,' Egypt Exploration Society

or Cyprus. The metal was both moulded and beaten, and must have been in very general use for weapons and utensils early in the dynastic period.

Bronze does not appear until much later—in the Middle Kingdom. Iron has been found in the form of beads in predynastic tombs, though these examples may be meteoric in origin. Occasional finds of shapeless lumps show that as a metal it was not unknown in the Old Kingdom, but it remained rare until about 1000 B.C. The daggers of wrought iron from Tutankhamen's tomb are among the earliest examples of iron objects which have survived. Gold and silver were both known in predynastic times, the latter being the rarer; and it was undoubtedly the desire to control the Nubian gold mines that occasioned the Egyptian conquest of Nubia in the Sixth and again in the Twelfth Dynasty.

Gold was used in conjunction with a variety of semi-precious stones, carnelian, amethyst, green felspar and lapis lazuli, to produce the profusion of jewelry which adorned the persons of Egyptian men as well as women. Among the earliest examples are the bracelets from the First Dynasty tomb of King Zer (see page 489),

and among the most perfect are the pectorals and necklaces of the period of the Twelfth Dynasty from Dahshur, and more recently from Illahun. These last are remarkable for the use both of granulation and of inlay of precious stones in gold in a sort of cloisonné work.

The art of the potter had a curious history in Egypt. It had already reached its height in the predynastic period, when the potters were producing, without the use of the wheel, vases distinguished not only by excellence of technique but by perfection of form. The art suffered a heavy blow when increased skill in the working of the finer stones, alabaster, slate, pink breccia, serpentine and even the hard diorites, led these materials to be preferred



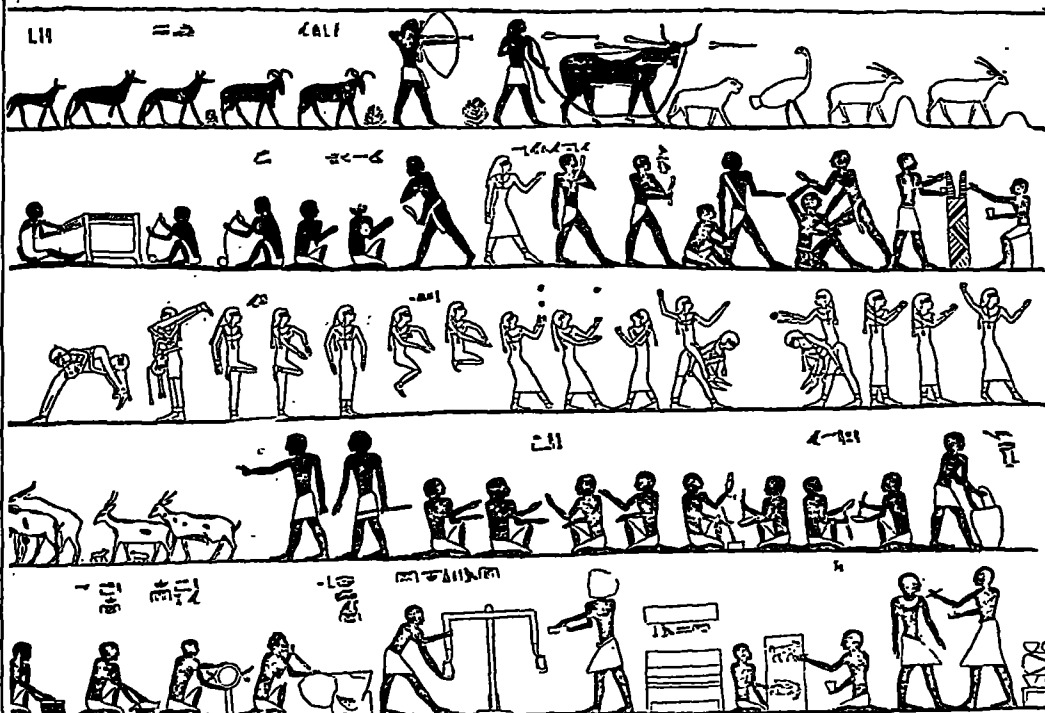
HALF-NELSON 4,000 YEARS AGO

This is a detail photograph of one of the episodes in the great wrestling scene, of which part is given at the top of the page; the grip is complicated, but certainly resembles a half-Nelson. It occurs in a rock-cut tomb at Beni Hasan.

Newberry, 'Beni Hasan,' Egypt Exploration Society



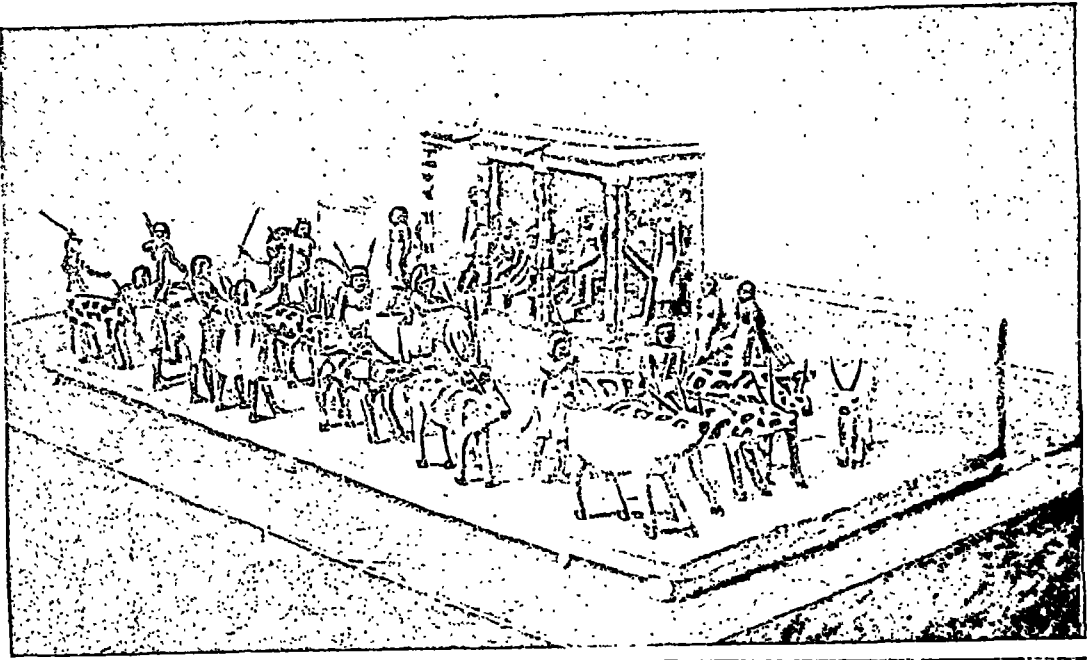
Designed with consummate skill, these wall paintings in an Eleventh Dynasty tomb at Beni Hasan constitute a comprehensive survey of every-day life on an estate. We see washermen beating, wringing out and drying linen, and girls spinning and weaving. Herdsmen are leading their cattle homewards; and, in short, every manual labourer is busily employed. Others of the staff are not overlooked; acrobats practise their tricks; and a seated scribe receives taxes, while two defaulters are led before him.



Considering the importance of art in the national life, it is only natural that artists at work should be depicted in Egyptian paintings. In these panels we see painters making sketches and decorating a statue. Humbler people, perhaps, are the craftsmen—goldsmiths and twine-makers. Scenes of hunting and merrymaking are included; girls are shown dancing and juggling, performing acrobatic feats and playing ball games, their attitudes suggesting light-hearted abandon.

ACTIVITIES OF THE COMMON FOLK OF EGYPT GRAPHICALLY RECORDED

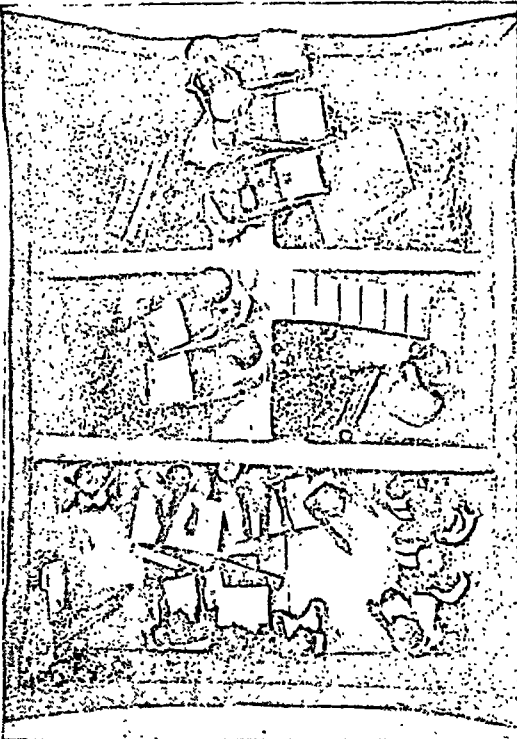
From Newberry, 'Beni Hasan,' Egypt Exploration Society



An Egyptian noble was evidently accustomed to count his own herds; here we see models, each about eight inches high, driving cattle before their lord, Mehenkwtetre, who, surrounded by attentive scribes, is seated on a covered dais.



Work in the slaughter-house was carried out by butchers in a thoroughly efficient manner.



It would appear that a nobleman's family and retainers formed a highly organized and almost self-sufficing community—this is suggested by models such as those from the tomb of Mehenkwtetre. The miniature granary, in which labourers are storing corn while clerks record its amount, and the carpenter's shop help us to realize the manifold nature of everyday life in a society of this kind.

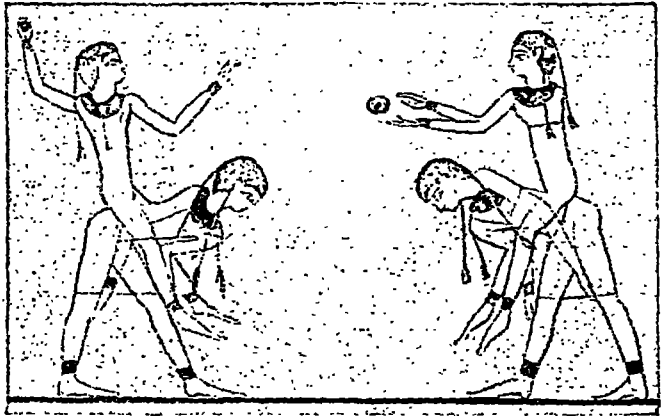
INTELLIGENT DIVISION OF LABOUR ON AN EGYPTIAN ESTATE

Courtesy of Metropolitan Museum, New York

to clay. The making of stone vases reached its highest point of excellence under the first two dynasties. Clay had also to compete with hammered copper as a material for the making of vases, and, despite the introduction of the potter's wheel early in the Old Kingdom, pottery never recovered its prestige or its perfection and is uninteresting throughout the Old and Middle Kingdoms, except for the intrusion of the beautiful Nubian black and red wares towards the end of the period.

The art of glazing, discovered in remote antiquity, had a long and important history in Egypt. The glaze was nearly always of a blue or green colour, and in early times was applied usually to steatite or rock crystal.

The use of flint for tools and weapons reached its culmination in the wonderful ripple-flaked knives of the later predynastic period. The material continued to be used, though sparingly, under the early dynasties. By the time of the Middle



GIRLS AT A GAME THAT CALLED FOR BALANCE

Games of ball were favourite pastimes among Egyptian girls. This scene in a Beni Hasan tomb seems rather to be in the nature of juggling, for the performers are carried pick-a-back, and have two balls in play at the same time.

Newberry, Beni Hasan, Egypt Exploration Society

Kingdom hardly any knives were made of flint except those required for sacrificial purposes, where this primitive material was presumably still prescribed by tradition.

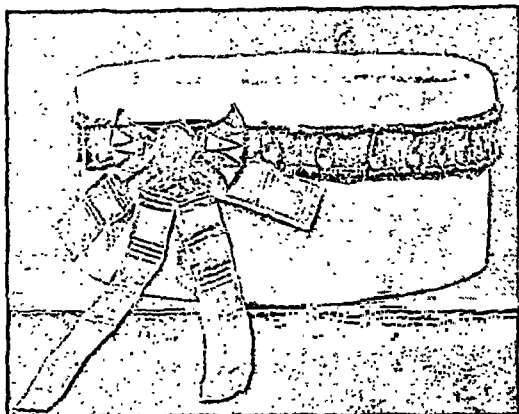
Wood was used in Egypt in such quantities that many, though not necessarily rightly, suppose the country to have been much more heavily forested in ancient times than it is to-day. The



DANCERS WHOSE ART ADORNED A VIZIER'S FUNERAL

Music and dance were not only the normal relaxations at an Egyptian feast, but were employed largely in temple ritual. The four dancers in this wall painting from the tomb at Thebes of Antefoker, vizier to Senusret I, are probably votareesses of the goddess Hathor taking part in the funeral ceremony; notice the curious tress of hair, peculiar to dancers, worn by the pair on the left. The three elder women in the background are beating time to the dance with their hands.

From Davies, Tomb of Antefoker



FROM A PHARAOH'S BROWS

The royal character of this inlaid gold fillet that once belonged to King Intef of the Eleventh Dynasty is shown by the snake's head ('uraeus') seen projecting above the mounting. This is the back view; how it was worn is shown by the illustration on page 553.

Courtesy of British School of Archaeology in Egypt

amount of furniture in a poor man's dwelling was probably almost as negligible as it is in modern Egypt, but in that of the rich man there was a profusion of chairs, beds, tables and store-chests. Tomb paintings frequently show us the carpenters and cabinet-makers at work, their simple tools consisting of the adze, used almost as universally as to-day, the saw, the drill, the chisel and the mallet. Metal nails were not in general use, their place being taken by simple but accurately fitted dowels or pegs, and even by ties made of cord or twisted gut. Very little furniture of the Old and Middle Kingdoms has survived, and we are mainly dependent for our knowledge on the paintings in the tombs. The process of overlaying wood with gold foil is several times shown, and much damaged examples of this art have lately been discovered in the new Fourth Dynasty tomb found by Reisner near the Pyramids at Gizeh.

We must now turn from internal and domestic affairs to glance at the relations of Egypt with her neighbours, for these had a very important bearing on her history and on her national character. The text-books mostly tell us that the Egyptians were an unwarlike and peace-loving people, that in early times they had no standing armies, and that they rarely engaged in war before the New Kingdom. This is a totally incorrect view,

and new discoveries show almost from year to year how very far from the truth it is. As a nation the Egyptians may have loved peace: most nations do. But their peculiar geographical position made it impossible for them to enjoy it constantly. They accepted war as a necessity, and, even if they did not pursue it for its own sake, they at least gloried in their martial achievements. From the beginning to the end of Egyptian history the monuments chronicle war and its victories, and even in the reliefs on the temple walls the king victorious over his foes takes his place side by side with, or even to the exclusion of, scenes of divine worship.

Our acquaintance with Egyptian warfare begins in predynastic days. On the Giraffe Palette (see page 483) defeated foes, probably of Hamitic race, are represented as being devoured by lions and vultures, and one of them is being led off a prisoner by a man dressed in a long decorated cloak, perhaps an Egyptian. King Narmer struck a cylinder seal in ivory on which the 'nar' fish with which his name is written is shown with human arms smiting an enemy whom the hieroglyphs beside him proclaim to have been a Libyan. Another well known palette shows on one face the destruction of walled towns, while on the other are rows of oxen, asses, sheep and olive trees accompanied by the sign for Libya.

The great palette of Narmer depicts him defeating a people who inhabited a district the name of which is expressed by



FIT JEWELRY FOR A QUEEN

Jewelry was superb under the Middle Kingdom—the Egyptian always excelled in such fine work of his fingers. The crown of Princess Khnumuit, daughter of Amenemhet II, is of blue flowers with carnelian centres borne on a delicate gold filigree.

From Dahshur (Cairo Museum)

a falcon over a harpoon, preceded by signs which appear to mean the 'Great Door.' Some have supposed that this must be a Mediterranean port in the north-western Delta, and would have us see in Narmer the Menes of tradition, and in this representation the last act in the unification of the two kingdoms. This is, of course, conjecture, but at any rate the scenes depicted are not the deeds of an unwarlike people.

In the First Dynasty there occurred the conquest of the sparsely populated peninsula of Sinai, possibly not a very heroic accomplishment, but the beginning of the long series of expeditions thither in search of turquoise and possibly malachite. From the tomb of King Ka of the same dynasty came an ivory slip (also in page 483) with a figure of a bound prisoner labelled Sethet, an early name for the region of the First Cataract, used also from the Twelfth Dynasty, if not earlier, for Syria. An ivory tablet (page 497) of King Den, also of the First Dynasty, commemorates a year of the king's reign named after the 'first occasion of smiting the East,' that is, either the desert east of Egypt or, as in later times, Syria. Truly these kings are no men of peace.

When we reach the Old Kingdom our evidence becomes more explicit. Apart



WORN ON THE BREAST OF EGYPTIAN KINGS

Among the insignia of Egyptian royalty was a pectoral or breast ornament; Middle Kingdom examples, of openwork gold inlaid with precious and semi-precious stones, are exquisite. That of Senusret II on the left shows the hawk Horus wearing the double crown; that of Senusret III symbolises the king's might by hawk-headed lions.

from the continuous series of reliefs illustrating victories in Sinai we have the representation in the Fifth Dynasty tomb of Anta at Deshasheh of the storming by Egyptians of a foreign city, almost certainly Asiatic. King Ne-user-ra of the same dynasty represents himself on the wall of his pyramid temple as treading underfoot foreigners of three kinds, Libyans, Asiatics and men of Punt, a coastal region somewhere near the modern Somaliland. In whatever way we interpret the geography of the inscriptions of Weni, a warrior-noble of the Sixth Dynasty, it is almost certain that he conducted a campaign in South Palestine, transporting a force thither by sea in order to take an attacking foe in the rear.

The fall of the Sixth Dynasty and the invasion of the Delta by Asiatics put an end to these adventures for the time being. No sooner had the Thebans reconquered their fatherland than we find them engaged in what may be regarded as a punitive expedition in Syria-Palestine: this we know from the autobiography of Sebekkhu. On a famous gold and inlay pectoral of Amenemhet III, the king is shown triumphantly smiting men of Semitic type entitled Menthu and Sethe-tiu, both names for inhabitants of Nearer Asia. There are other references to these wars, less explicit, perhaps, but equally convincing, and, though it is not at all likely that Egypt of the Middle Kingdom ruled an empire in Syria like that of Thothmes III or Rameses the Great in later times, yet she at least made her presence felt there.



FOR PHARAOH'S ADORNMENT

On the pectoral of Amenemhet III the king himself is shown (twice over) smiting miserable Asiatics with a bladed mace. Above hovers the vulture goddess Nekhebet, symbol of protection.

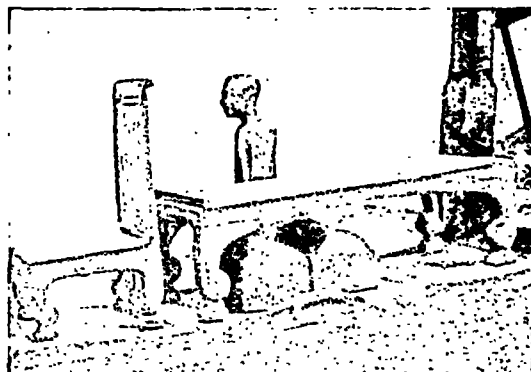
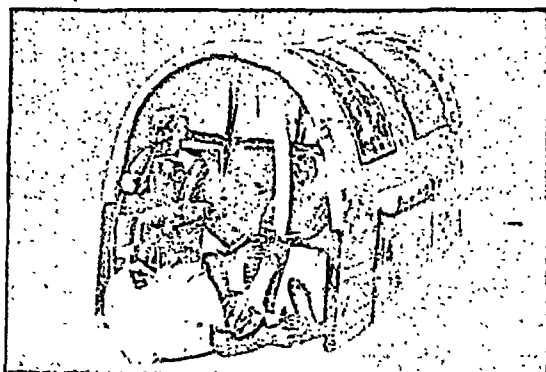
From Dahshur (Cairo Museum)



Women also had their special tasks. Here, while some members of Mehenkwtire's household spin flax with simple distaffs, others weave linen cloth on the flat looms seen on the floor.



Bread and wine had their important place in Egyptian domestic economy. Above are bakers kneading dough, which others place in ovens; and labourers treading the grapes in the press.



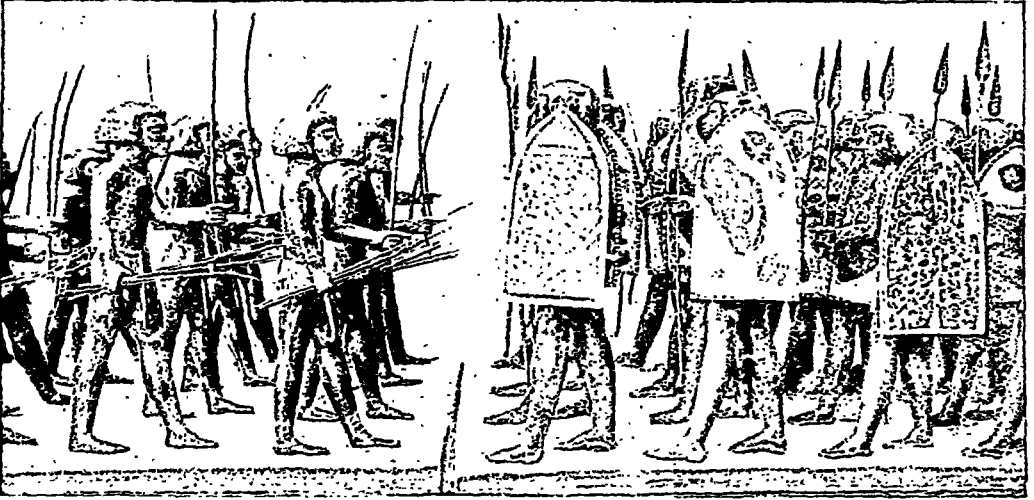
Together with those who supplied his grosser, bodily needs—weavers, bakers, vintners and the like—Mehenkwtire also had servants who afforded him spiritual gratification; he is seen in the deck-house of a model Nile vessel, attended by two minstrels. His cabin interior (right) is extraordinarily modern, with its chair, its bed and two trunks watched by a steward.

SERVANTS WHO MINISTERED ASSIDUOUSLY TO THEIR LORD'S COMFORT

Middle left, British Museum; remainder, Metropolitan Museum, New York

To the south lay a country of a very different type, namely Nubia. It is clear that the Egyptians throughout regarded this land merely as a channel whereby they obtained gold from the mines and various other highly prized products of the upper reaches of the Nile, more particularly ivory, skins and ostrich feathers. The recent excavations at Kerma at the Third Cataract have shown that as early as the Sixth Dynasty there was a strong Egyptian outpost here. The

periods imported from there the finer woods, especially cedar, with which they built their palaces and the temples of the gods. A dismal composition which purports to reflect the condition of Egypt during the Seventh to Tenth Dynasties, when access to Syria was cut off, pathetically asks what is to be done to obtain cedar and its oil for the coffins and embalming of the dead. This trade with Syria took place by sea rather than by the dreary and difficult land route, and one of the most



ARMS AND EQUIPMENT OF EGYPTIAN REGULAR INFANTRY

A light is shed on the military complexion of Egyptian life by a set of models (Eleventh Dynasty) representing two battalions of infantry. On the right is the heavy-armed infantry equipped with leather-covered wooden shields and metal-tipped spears. The metal of the latter is probably intended to be bronze, which at this period began to displace copper. Opposite them stand the light-armed troops whose sole weapons are bows and arrows; the Egyptians were noted archers.

Cairo Museum, courtesy of Sir Flinders Petrie

definite conquest of Nubia, however, was left for the Twelfth Dynasty to accomplish. After a few tentative expeditions by the earlier kings of the dynasty, Senusret III led his forces thither in person and subdued the whole country, establishing a system of strong frontier and outpost fortresses.

It must not be thought that Egypt's relations with her neighbours were wholly hostile. The recent discovery of Egyptian objects of the early dynasties in a temple at Byblus on the coast of Syria indicates not an Egyptian conquest of that town but ancient and friendly relations, of which the reference to Byblus in the Osiris tradition preserves a still more remote echo. Syria produced much that Egypt needed, and Egyptian kings of all

ancient types of boat named in Egyptian inscriptions is the Kepenit or 'Byblus boat.'

The Egyptians were expert sailors and boat builders, and when we find Cretan pottery of Middle Minoan type in the ruins of the Middle Kingdom town at Illahun we need not necessarily assume that the Cretans rather than the Egyptians were the carriers. It seems to be proved beyond all doubt that Egyptian stone vases of Old Kingdom type found their way to Crete, and there are not wanting those who would trace back the connexion even further, though on less convincing evidence.

Not only on the Mediterranean but also on the Red Sea Egyptian maritime enterprise was early astir. The semi-tropical country of Punt, somewhere on the African

coast near the south end of that sea, provided a substance essential to the Egyptians for the service of the gods, namely incense. From time to time expeditions were sent thither, and ships for the purpose were built on the Red Sea or Gulf of Suez, for we hear of a Sixth Dynasty official having been slain by desert-dwelling Syrians (Aamu), while engaged in constructing a fleet for Punt.

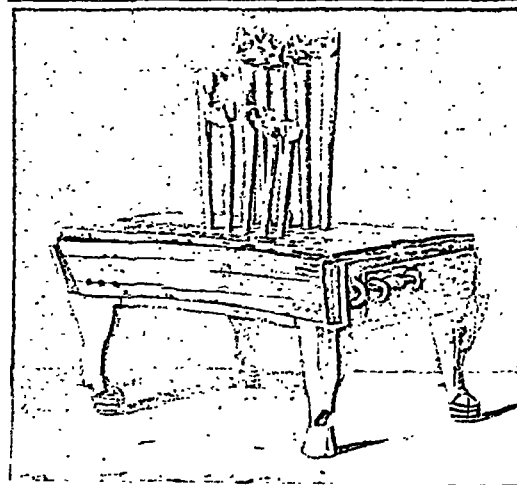
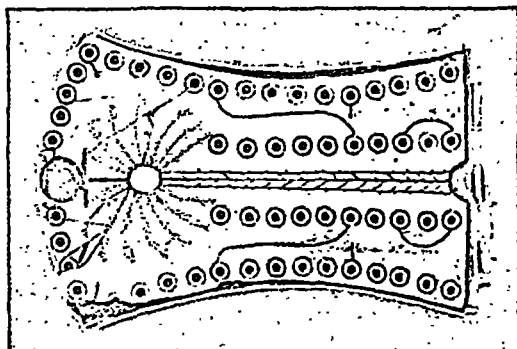
A word may be added here as to the condition of the practical sciences of mathematics and medicine. The mathematical papyri which have come down to us consist almost solely of sets of examples worked out. The numerical notation was complete up to a million, units being represented by strokes up to 9, tens by from one to nine loops, hundreds by from one to nine spirals, and so on. In such a

system multiplication by ten was simple, for it was only necessary to turn strokes into loops or loops into spirals and so on. The only other number by which direct multiplication was permitted was 2, and more complicated multipliers were dealt with in steps, 7 being, for instance, 2-times plus 4-times (got by doubling 2-times) plus one-time. Division was merely reversed multiplication.

Fractions were allowed, but only those with 1 as numerator (aliquot parts), such others as arose in the course of multiplication by 2 being at once split up into aliquot parts by a set of tables. The area of square and rectangle and probably triangle were correctly known: the area of a circle was found by squaring $8/9$ ths of its diameter, a very good approximation. The volume of the parallelepiped was rightly estimated, and, surprising to relate, so also was that of a truncated pyramid. Simple square roots and a formula for summing the geometrical progression also seem to have been known.

The medical and veterinary papyri are equally concrete and equally formal. They contain practically no statements of general principles, despite the fact that mummification must have given unrivalled opportunities for the study of human anatomy. As a rule each section gives a single case of sickness, with symptoms, diagnosis and treatment. The treatments consist either of taking medicines internally, generally in water or milk, often for four successive days, or in external applications. The materia medica of Ancient Egypt contains a number of simple remedies used all the world over for common troubles, and no doubt correctly prescribed and used in Egypt.

Their use was, however, complicated by two curious considerations. The first was the superstitious belief that medicine could not be effective unless it contained some filthy ingredient such as the excreta of animals, and the second was magic. Almost every prescription was to be taken to the accompaniment of certain magic formulae. One indeed of the medical papyri which has survived lays much more stress on the formulae than on the drugs,



BOARD FOR A GAME OF CHANCE

Found in a late Middle Kingdom tomb at Thebes this exquisite gaming board (6 by 3 in.), with its ivory top and dog- and jackal-headed pieces, could be used for play to-day, since ingenuity can reconstruct the rules. The drawer is secured by copper staples and an ivory bolt.

From 'Five Years' Exploration at Thebes,' Earl of Carnarvon and Howard Carter

for the proportions of these are not even stated. Thus on medicine as on religion magic laid its devastating touch. Medical science was already old in the Middle Kingdom and yet it made no advance from that time onward. Magic had stopped its growth.

What was the nature of this blight which had so baneful an influence on thought in Egypt? 'Hike,' or magic, was the belief that forces external to oneself—for example, gods, the dead, other men, animals, nature itself—could be controlled by the utterance of certain prescribed words or the performance of certain prescribed acts in the prescribed way at the correct moment. The system used was what is known as the 'sympathetic.' Thus it was thought that a burn could be cured by the use of certain words used by the god Horus when he was once burnt, or that one could hurt one's enemy by making a wax figure of him and sticking pins into it. We have already seen the use to which this belief was put in religion, and the manner in which the dead were provided with a whole series of such magic spells written on their coffins, or later on a roll of papyrus, wherewith to meet triumphantly all the perils which beset even the good man in the next world and on his journey thither. Far back in remote ages 'hike' had become a vested interest in Egypt—there was even a god called Hike—and no one ever had the courage to free any branch of thought or science from the paralysis which it caused.

The history of Egyptian art, like that of every other aspect of the nation's development, consists of alternate light and



A RUGGED ART

After a period of degeneracy art revived with the Twelfth Dynasty, but an art whose mark was brutal strength rather than grace and naturalism. This figure of Ptah-em-saf, chancellor of Lower Egypt, is typical.

British Museum

dark patches. The Old Kingdom was perhaps the brightest patch of all, and in sculpture and painting the standard then reached was destined never to be surpassed and rarely equalled in later days. During the period intermediate between the Old and the Middle Kingdoms men's minds had been far too busy with other things to think of building tombs or palaces for themselves or temples for the gods. Consequently the main incentive to art was lacking. The Heracleopolitans, however, of the Ninth and Tenth Dynasties were clearly enlightened monarchs who patronised the arts, and the all too scanty remains of their efforts show that the tradition of the Old Kingdom had not been lost even in the north.

With the Twelfth Dynasty the artists of Egypt again found full scope for their powers. Strange to relate we can say absolutely nothing of the architecture of that age, for not a single building remains to us save the brick pyramids of the kings and the scanty remains of the

temples attached to them. The substitution of the brick pyramid for the vast stone structures of the Fourth Dynasty began with the Fifth, and is perhaps partly symptomatic of the diminution in the prestige and power of the king as against the nobles, but still more a sign of the return of common sense and the recognition of the fact that the employment of the whole labour of the land in such vast enterprises was uneconomic.

For the burial of noblemen the type of tomb hollowed in the face of the cliffs now tended to replace the mastaba with its underground burial chamber, and it is from such tombs at Beni Hasan,

El-Bersheh and elsewhere that our main knowledge of the life of the period is drawn. Here relief sculpture has mainly given way to painting on the flat, and in this as well as in general finish and design these tombs are very inferior to the best work of the Old Kingdom, and even to the transitional work at Mer. Their value for us is representational rather than artistic.

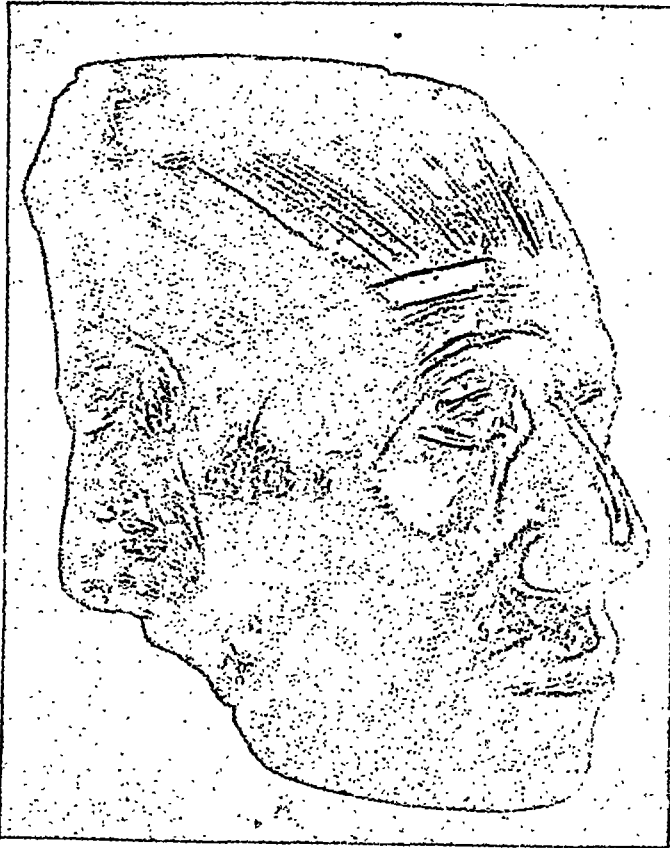
Sculpture in the round, however, now took a new lease of life. Unfortunately the period is known to us almost entirely from a dozen or so of royal statues or busts, of various sizes and in various materials, and it is precisely in such royal pieces that conventionality is most to be expected. Yet all have very definite marks of the period and not one could have been referred either to the Old Kingdom or to the New Empire. There

is a massive strength about them. They are more 'powerful,' in the artistic sense of the term, than anything from the Old Kingdom, but they are less pleasing. They are not men of like passions with ourselves who really lived and died, like the Sheikh-el-Beled or the Louvre Scribe, but cold but cold unearthly creatures strong and forceful who sit aloof—a breed

of giants. And so we are unsympathetic towards them, and while we recognize the artistic merits in the colossal head, supposed to be of Senusret III, now at Cairo, and while we may see in the MacGregor obsidian head of Amenemhet III one of the world's greatest triumphs over an intractable material, yet we pass with a feeling of relief and pleasure either back to the real flesh and blood of the Old Kingdom or on to the gentle smiling ladies and amiable if insipid courtiers and kings of the New.

The achievements of the Egyptian people covered not only the field of arts and crafts, but also the realm of knowledge. It is as yet too early to affirm with conviction that they and they alone were the discoverers of writing; suffice it that as early as the First Dynasty they had already evolved a script capable of expressing their language. In origin it was purely pictographic; that is, in order to convey the idea of a house they drew a simple house and so on. The limits of such a system were soon reached, for none but the very simplest and most concrete ideas could be expressed in this way.

A stroke of genius provided a solution for this difficulty. When it was desired to express an idea such as 'to remain,' of which it was impossible to draw a picture, the picture was drawn of some other word which had precisely the same sound. Thus the word 'mane' was



SUPERB EXAMPLE OF PORTRAIT MODELLING

This obsidian head of a Twelfth Dynasty king is one of the sculptor's triumphs for all time. Yet compare its dry, harsh, forceful lines with the gentler intimacy of Old Kingdom work; the artist who carved it was a genius, but not a lovable genius. Amenemhet III was most probably the original.

Courtesy of Egypt Exploration Society

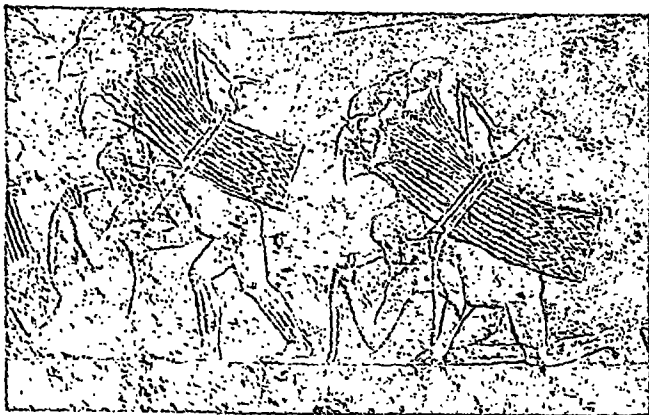
the name of a board used in playing a certain game with moving pieces, and exactly the same group of sounds, 'mane,' was a part of the verb that meant 'to remain.' Consequently the picture of the board surmounted by its pieces could be used to write this part of the verb 'to remain,' and also, by extension, other parts of it.

In this way pictures were gradually found wherewith to write the sounds of all the words of which no picture could be drawn, and it will easily be seen that such pictures when so used became purely phonetic in purpose, standing now simply for a group of sounds and no longer for the object of which they were pictures. Some of these groups happened to consist merely of one consonant and a vowel, and by ignoring the vowel the Egyptians thus acquired a series of phonetic signs each standing for a single consonant, or in other words an alphabet. With true Egyptian conservatism, however, they failed to exploit to the full this admirable discovery, and so missed becoming the fathers of our alphabet, for they continued to use all the various kinds of signs, pictographic and phonetic, which they had evolved, even inventing a new kind, the generic determinative, a sign which, placed after the phonetic spelling of a word, showed to what genus of objects it belonged, as, for example, a man, or a tree or a fish.

This system of writing, known to us as hieroglyphic, was from early times used for inscriptions on stone,

and those who know the developments in hieroglyphic script tombs and temples of Egypt will agree as to

its high decorative value, which the Egyptian artists did not fail to exploit. For every-day purposes, however, such a system was impracticable, and it was replaced by a script in which more rapid and sketchy forms of the signs were written in ink with a reed pen on leather or papyrus: this is known to us as hieratic. The papyrus reed was then a native of the Delta marshes, whence it



GROANING UNDER THE PAPYRUS HARVEST

Papyrus, now extinct in the Delta but once plentiful there, was one of the sources of Egypt's wealth; the paper made therefrom was exported all up the Syrian and Palestinian coast. The actual use to which it is about to be put in this tomb relief from Mer is the making of a reed boat.

From Glackman, *Rock Tombs of Mer, Egypt Exploration Society*

has now disappeared, and several scenes in the tombs show us the papyrus harvest. The sheets of paper on which the Egyptians wrote were made by gumming together in a double layer strips of the fibrous interior of the stems.

By the end of the Twelfth Dynasty the Egyptians had attained a considerable height of achievement in literature. Little has survived from the Old Kingdom, and we cannot therefore assert with any confidence that here, as in so many other fields, the Old Kingdom was the high-water mark of accomplishment. What is, however, certain is that a great contribution was made to literature and thought by the Heracleopolitans of the Ninth and Tenth Dynasties, and when, if ever, we come to know more intimately the story of these dynasties we shall probably find that they took a very important place in the cultural development of the country.

The inscriptions in the chambers and passages of the Fifth and Sixth Dynasty pyramids (those of the Fourth are uninscribed), although formal in tone, reveal a language capable of poetic expression, and even an elementary attempt at strophic arrangement similar to that of some of the much later Hebrew literature.

From the Heracleopolitan period, or the years immediately following it, has survived a group of compositions which may be classed under the heading of

pessimistic literature. They are the product of the depressing conditions of the period and the invasion of the Delta. In one of them a man discusses with his soul the evil plight of his country, and asks whether it be not better to take refuge in suicide. In another, King Sneferu of the late Third Dynasty is warned by a prophet Neferrohu of dreadful events in store for the land: 'I show thee the land upside down; things happen which never happened before. Men shall take up weapons of war; the land lives in uproar.' This is clearly a prophecy made after the event, but it well reflects the deadening effect which the misfortunes of the Seventh to Tenth Dynasties had had on the Egyptian people.

It is refreshing to turn to the literature of the full Middle Kingdom after this, but it may be doubted whether its literary value is as great. We have, for instance, the story of the Shipwrecked Sailor, which is nothing more or less than a fairy tale of the most naïve type. Then we have the story of Sinuhe, an Egyptian exile in Syria, a much more sophisticated production and, as such, less attractive. Next comes the Eloquent Peasant, in which a peasant who has been ill-treated

by an official complains to a higher authority in such eloquent terms that his complaints are thought fit to be laid before the king for his entertainment. Let us hope that their overdrawn similes and exaggerated compliments were more to the taste of his majesty than they are to that of the modern reader. Far superior in literary value are the Instructions of Ptahhotep, a composition perhaps having its roots in the Fifth Dynasty when the vizier Ptahhotep flourished, and one of the earliest examples of that didactic literature which was to have such a vogue in Egypt, and which is so well illustrated in Hebrew by the Proverbs.

What is to be said of the Egyptian mentality as revealed by these and similar writings? Modern judgement is that the reputation for wisdom enjoyed by the Egyptians in antiquity was almost wholly undeserved. It probably arose out of the philosophical and scientific activities of

Alexandria at a time when Egyptian thought and culture were wholly overlaid by Greek civilization. Plato, however, and he alone, saw the Egyptians for what they were, a 'nation of shopkeepers.'

They never had the philosophical temperament. Their religion was a mass of myth and legend: speculation as to the nature of existence, of life, of death or of morality was totally foreign to their Egyptian mind nature. Conservative in the extreme, reluctant to consign anything, however valueless, to the mental scrap-heap, capable of holding at one and the same time two directly opposed beliefs without being conscious of any incongruity, they were doomed to stagnate. Mental progress was impossible to such a people.

Wherein, therefore, lay their greatness as a nation? It lay in their firm and resolute grasp of the concrete and the practical. This is clear in all their literature. The didactic papyri deal with rules of conduct. When they tell us how to behave at a neighbour's table it is mainly with a view to securing another invitation. Virtue is inculcated not as something having an abstract and eternal value in itself, but because 'vice never brings its venture safe to port.'

Similarly in the scientific papyri there is no trace of the love of knowledge for its own sake, only for what it can accomplish in the concrete. The mathematical papyri which have come down to us contain not generalisations and inductions, but hosts of examples in which three and seven are not abstract numbers but three loaves or seven oxen. In the same way the medical papyri betray practically no interest in the structure of the body or in the general nature of disease, but only in the method to be used in curing specific cases of illness.

From the modern point of view these are defects of culture. But who shall blame the Egyptians because they failed to produce Plato or Pythagoras? Let us rather admire them for that intensely practical genius, that adaptation of means to ends, and, above all, that high artistic sense which enabled them to make to ancient civilization perhaps the biggest contribution ever made by a single people.

BABYLONIA IN THE DAYS OF HAMMURABI

The Complex Life of the Land of the Two
Rivers after the Fusion of Sumerian and Semite

By R. CAMPBELL THOMPSON D.Litt.

Fellow of Merton College, Oxford ; Author of *Semitic Magic*, etc.

CONTRAST the two lands, Egypt and Mesopotamia, which at first sight have so much in common, and yet in reality are as widely different as the character and the philosophy of life of the two peoples who inhabited them.

There is a healthy magic in the crisp air which blows across the Nile, heavily scented with the fragrance of the bean-fields; there is the bounty with which the Great River dowered Pharaoh each year through its flood; there is the unending fascination of the dry, sunburnt ranges which clip the broad vale from end to end on either hand.

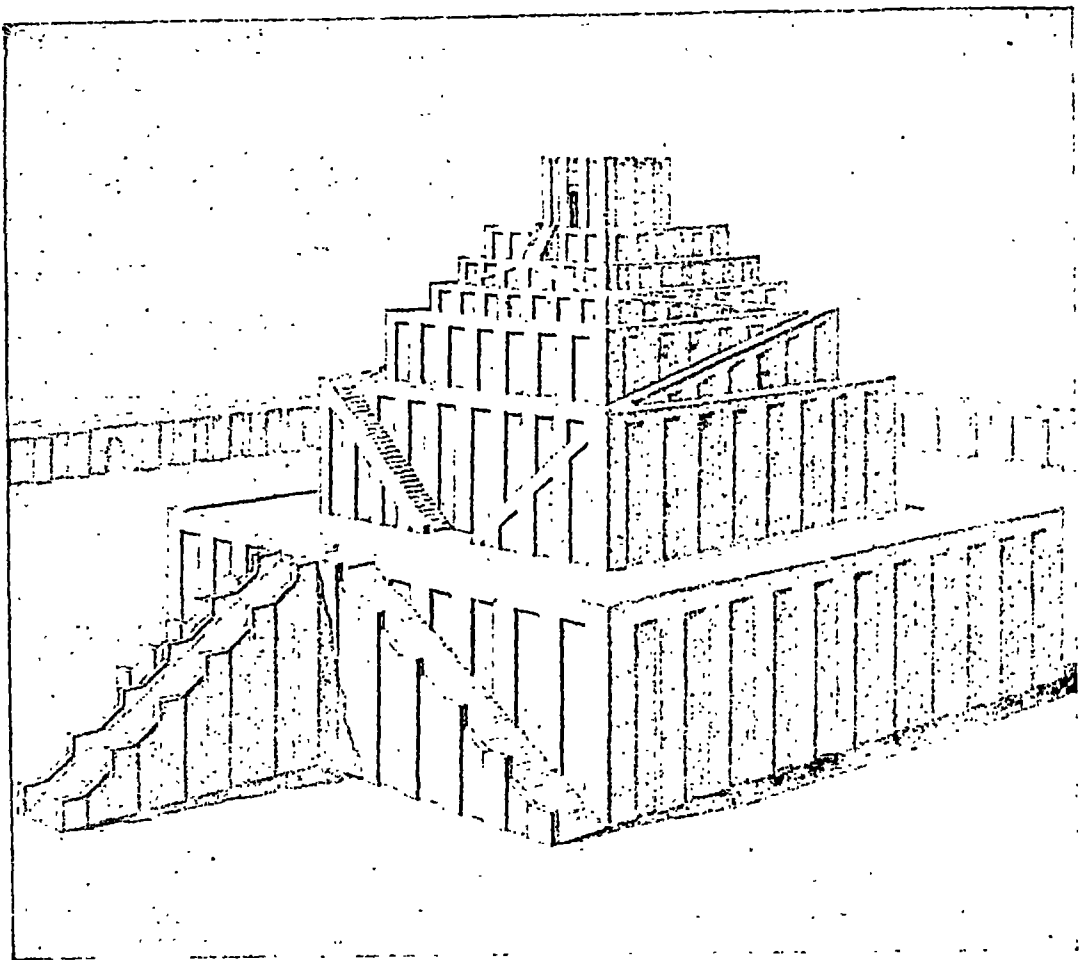
Not so the lands of Babylonia, watered though they be by the two great streams, the Euphrates and Tigris, flanked on the eastern side by the dim, mysterious mountains of the Persian sunrise. For these rivers, when they rise in spate, have nothing of the genial beneficence of the Egyptian river: even if the high banks can contain the surging flood, it is at best a foaming, muddy torrent, while if it swell beyond its bounds it brings havoc in its far-stretching expanse, spreading wide in a broad, shallow sea such as has from of old left a thankless mark even on the country's religious myths. The very mountains of harsh, rugged limestone, topped with snow in winter, were a horror to those who had sweltered through the summer in the steaming valleys under a pitiless sun. Mesopotamia is a land of extreme variations of climate, where the heat reaches 124° F. in summer, while in winter there may be snow even as far south as Babylon.

Egypt, on the other hand, is more uniform than any other place on the globe, and whatever might be the height of

summer temperature in Egypt, the king of Egypt had never cause to boast of a tremendous contrast between winter and summer. Perhaps he might complain, like Nebuchadrezzar I in his war against the Elamites (see Chronicle II), that 'the axe-head burnt like fire,' but never, like Esarhaddon, vaunt his defiance of the snow and wintry weather of the month Sebat. The climatic and geographical contrasts between the two lands mirrored themselves in the differences in the two peoples, the harsher conditions of life in Mesopotamia showing their reflex in the dour nature of the inhabitants, among whom the outlook was on the whole, perhaps, gloomier and more morose than in Egypt.

Albeit nature cannot be said to have been generous in her primal gifts to Mesopotamia, there must have been some good reason for the hillmen of Susa and the Sumerians of the Turkistan Lure of the fertile
Babylonian valleys steppes to have descended into the lower swamps of Babylonia. The lure which attracted these mountaineers may well have been the great fertility of the Irak valleys after cultivation, for in other respects it is a jejune land, where in prehistoric times Man was hard put to it to obtain even the stone wherewith to make his tools.

Pasture he would find for such animals as he might have, but apart from this his earliest assets would be the clay and reeds. On the clay he depended for his bricks, his pots, his reaping hooks and (after he had discovered how to write) his tablets, while the reeds gave him his reed huts, his baskets, his mats, even part of his food and, later on, his pens. The date palm,



RECONSTRUCTION OF THE FAMOUS TEMPLE-TOWER OF BABEL

It can almost certainly be maintained that the huge tower of E-temen-an-ki, 'the brazen-doored sanctuary' of the god Marduk at Babylon, was the Tower of Babel of Genesis. We do not know its original height, but it had seven stages crowned by a shrine, and thus to dwellers in flat country might appear to 'reach unto Heaven.' This was apparently the intention of its builders, for almost every city in Babylonia had such a tower connected with the worship of its gods

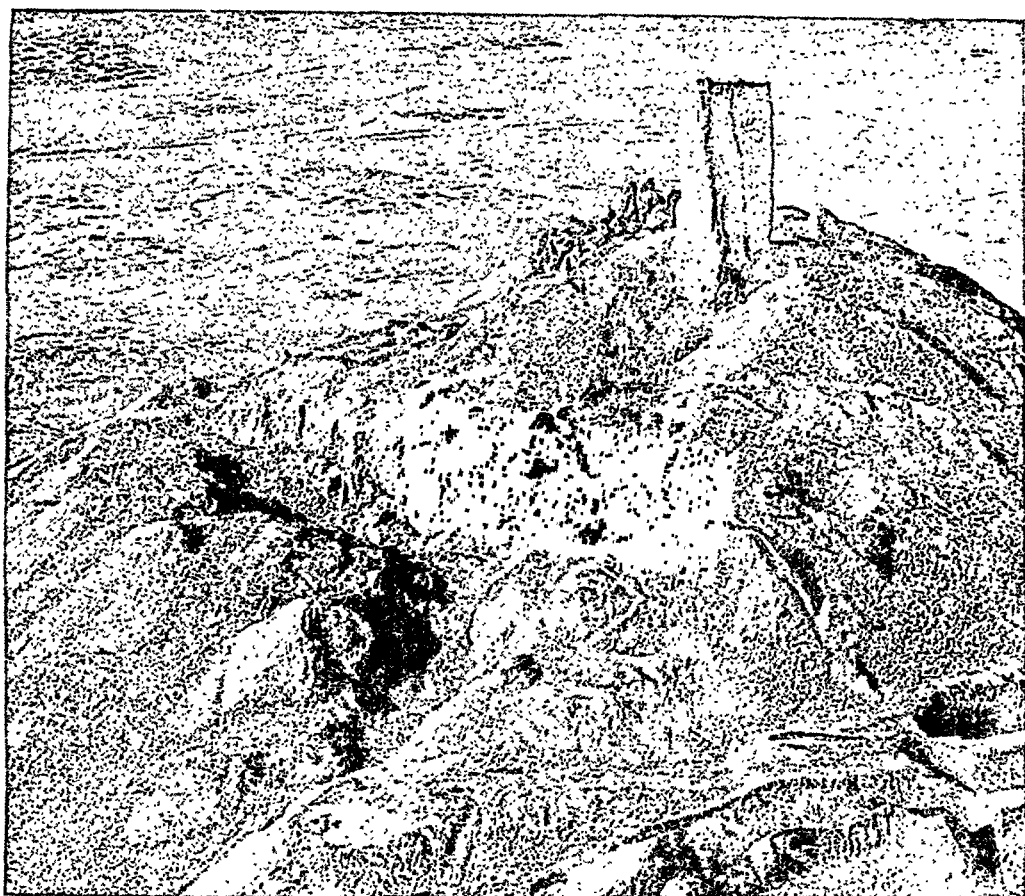
Modified from Koldewey

as soon as he learnt how to cultivate it, was the great resource of the land, for it yielded him sweet fruit, treacle and arrack, and it could be cunningly made into furniture, roof-beams, and foot-bridges over the canals.

Far behind it in value were the tamarisks, the willows, the acacias and the mulberries; but even these were too valuable to be used for fuel in a land where wood was scarce, and the housewife had a choice between the desert scrub, the bases of the palm branches or dried dung made into cakes wherewith to bake her daily stint of bread. But as a grain-producing country Mesopotamia was magnificent, and nature showed that if only due labour were given she was no niggard in granting crops.

As Man's range of supply extended, through warlike conquest or mercantile adventure, he laid under contribution the resources of Persia, Anatolia and Egypt, and could import the pine, fir, cedar, cypress, maple, dwarf-oak, box, myrtle and laurel. His principal crops were barley, wheat, sesame and millet; his fruit, dates, pomegranates, grapes, apricots, melons, figs, medlars, quinces, apples and probably limes; his vegetable garden brought forth abundantly. Indeed by the seventh century he could reckon on nearly three hundred different names for various species of plants and trees.

In addition to the clay and reeds, he was able to obtain from Hit the bitumen for caulking his boats, mortaring his bricks and making heads for his clubs. Sandstone



ONE OF THE CITY MOUNDS THAT STREW THE PLAIN OF BABYLONIA

Projecting from the mound that half entombs it, this shattered pillar of brickwork, accidentally vitrified by fire, is all that remains of just such a temple-tower as is reconstructed in the opposite page. It is known locally as the Tower of Babel, but the identification is wholly imaginative; actually a fragment of E-Zida, the temple of Nabu, it marks the site of ancient Borsippa, a town that lay a few miles to the south-west of Babylon.

Photo, Royal Air Force Official, Crown Copyright

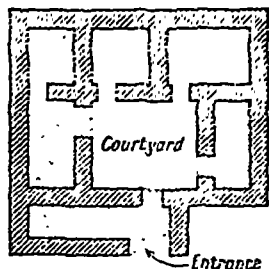
and limestone were available from some localities, but most of the harder stones he had to find in the far north or in Arabia. His precious metals came from afar, copper being found in Persia, silver and lead in the Taurus, and gold partly in the north and partly in Egypt. Lapis, jasper and serpentine were brought in from Persia, cinnabar from Kerkuk and haematite from Mardin.

By the time of Hammurabi his flocks were of sheep and goats, his cattle buffaloes and oxen and his beast of burden the ass, doubtless a descendant of the wild ass that roamed the plains. The camel appears to have been confined to the Arab tribes of the desert, for we hear comparatively little of it, and the horse is as yet only just beginning to be introduced. Gazelles,

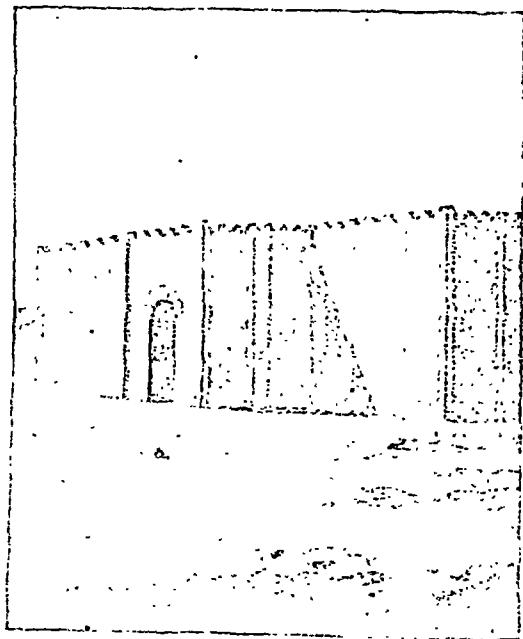
jackals, wolves, ostriches and bustards lived in the desert, and even the elephant to the far north-west; lions and wild boars inhabited the thickets near the rivers, and ibex the hills. Waterfowl, partridges, sand grouse, bee-eaters, kingfishers, rollers, eagles, buzzards, hawks and numerous kinds of small birds were to be seen in profusion.

The stranger, travelling to one of the larger Babylonian cities, must needs go by boat up or down the rivers, or attach himself to some caravan of merchants, who for their better security had banded together. If he were fortunate he would have an ass to ride; otherwise he must go on foot, following the laden beasts, camels perhaps, for, as has been mentioned, the horse had barely come in.

The first sight of his goal across the dull, unending levels would be the great pinnacle of the temple-tower of the city-god piercing the sky, a vast pyramid of adobe, faced with burnt brick, often divided into stages and even brilliantly coloured, rising several score feet above the plain with its corners set to the cardinal points. So solid were these towers that to this day their ruins rise as solitary peaks above the horizon ; perhaps the Sumerian hillmen, cursed with that homesick longing which is the heritage of mountaineers, hoping to retain some little reminiscence of the first craggy shrines in their native fastnesses, had built these towers that they might be a little nearer to the gods of heaven in their worship.



So, as he drew nearer, and the battlements of the brown walls became more distinct, he would leave behind the unowned, jejune desert, sprinkled



TYPICAL FORTRESS-LIKE HOUSE

Planned to afford their occupants privacy, Babylonian houses had no windows overlooking the street and only one entrance. They were flat-roofed and built of sun-dried brick. This drawing shows the probable appearance of the house whose ground-plan appears above.

After Koldewey

with its little pebbles or rare patches of dry shells, and reach the grazing lands where pastured the cattle and herds, ever under the watchful eye of shepherds ready to frighten away the lions and wolves by night. Then the paths became better defined, leading him through the cornfields, which in time of harvest

would always attract Nearing a City labourers from less agri- of old Babylonia cultural districts ; and so, through the orchards and date-palm groves, brilliant in spring with the flaming red of the pomegranate flower growing beneath the budding date clusters, until he reached the outer fringe of the dwellings and reed huts of the poorer folk, who were content to huddle outside the city ramparts, unable to secure a foothold within the populous enclosure, but seeking such protection as the aegis of the city bastions could afford. Here the caravans would halt, ranging their packs in a circle about the beasts and drivers for whatever shelter they might get from their poor fardels.

Then would the traveller pass through the great city gates, ponderous structures of wood and copper, girt with high towers jutting from the walls and made to withstand all attack save that of siege engines, all ready to be entrusted in time of war to the safe keeping of those city fathers, the judges. High and thick were the walls of sun-dried brick, often so old as to have become a solid, tough, welded mass, and within their circuit lay the city, brown, flat-roofed, with streets sometimes paved with rough cobbles from the river bed, more often not paved at all, and so becoming a slough of mud at the first rainfall, compelling housewives to go abroad in sabots or on pattens.

High above the cramped alleys loomed the central mound, the citadel, whereon lay the king's palace, the temple and its tower ; it was the height of magnificence for a king to build himself a ' *chaussée* ' of burnt brick and even of squared stone, brought with immense labour from afar. In Babylon, indeed, at a later period the great Processional Way, along which the national god Marduk was borne in such state by his thronging worshippers to his home in the temple of E-sagila, was built

of bricks and bitumen beneath a flagged pavement of limestone and red breccia.

Palaces and temples were solidly built of brick, both burnt and unburnt. The great desire of every man who had wealth enough was to build his house with a view to coolness in summer, warmth in winter, privacy from neighbours and protection from thieves, and so king and nobles planned their houses on the principle of one or more central courtyards surrounded by chambers, with windows (doubtless shuttered with wood) looking thereon. So, as the sun began to set, the walls would cast long shadows across the brick paving of the courtyard, and then could the master of the house have the couches strewn in the shade, where the evening breeze made the little trees of the court shake their delicate leaves.

In the hottest weather his bed would be brought out on the roof, which, as in all countries where the rainfall is slight, was flat, made of beaten clay on palm-trunks or poplars, surrounded by a parapet and drained by a great projecting waterspout. There was no fear of thieves, even in the ordinary houses of the well-to-do, for the one door which gave on to the street was of stout wood, and close behind it slept the porter. Cautious housewives preferred to have no windows in the exposed parts of the outer walls.

The king could afford to decorate his palace with stone carvings, copper plaques, or even great lions made especially to frighten away all nightly boggarts; his artists adorned the columns which bore up the porticoes with little segments of coloured stone and mother of pearl, arranged in patterns.

We get a rare picture now and then of what the king and his nobles or ladies looked like, thanks to the skill of the Babylonian sculptors. As befitted a good Semite, the king would let his hair grow to his shoulders, and keep his beard although removing his moustache. He wore a woollen mantle which enveloped



PROTECTORS AGAINST EVIL SPIRITS

The Babylonians and Assyrians believed themselves liable to be molested by terrible fiends; and, to scare these, carved lions were set up outside palaces—here we see the head of an Assyrian specimen. Terra-cotta figures of watch-dogs (right) may also have been buried beneath the thresholds of houses for the sake of protection.

British Museum

his left arm, leaving the right arm free, and descended to his ankles; and doubtless his nobles imitated him, or, like the commoner folk, wore theirs shorter. Men left their heads bare, or else wore a turban of some kind. The mistress of a house attired herself in a long robe crossed over her bosom, or (approximately at this period) a kind of vest worn against the body under a cloak rather like the modern 'abba,' while her slave girls perhaps went naked to the waist and with nothing but a skirt.

As time went on, and the Kassites took possession of the country, men adopted a long tunic with sleeves reaching to the elbow, and a high feathered headdress, but the women still retained the long robe to their ankles. Under Hammurabi the people went barefoot, rarely wearing sandals, but presently, when the Kassites broke loose from their mountains and swept down on Babylonia, they introduced foot-coverings very much like the soft string 'espadrilles' worn to-day by the Kurdish hillmen.

Those who took proper pride in their bodies washed themselves with a soap made of vegetable lye and castor-oil, or rubbed themselves with oil, for it was a country prolific of bodily parasites, and it

was not for nothing that the apothecaries recorded in their herbals the proper plant-drugs to use as prophylactics. Furthermore, just as the Arab to-day stains his fingers with henna, so did they with turmeric, saffron, mustard or 'thapsia,' a kind of yellow gum.

If you dined with a man of good family in Babylon in 2000 B.C., you and your host sat on stools at a small table to which slaves brought the feast. If the master of the house had no guests, his wife dined with him, but if there were other men not of the family she probably retired to the women's apartments.

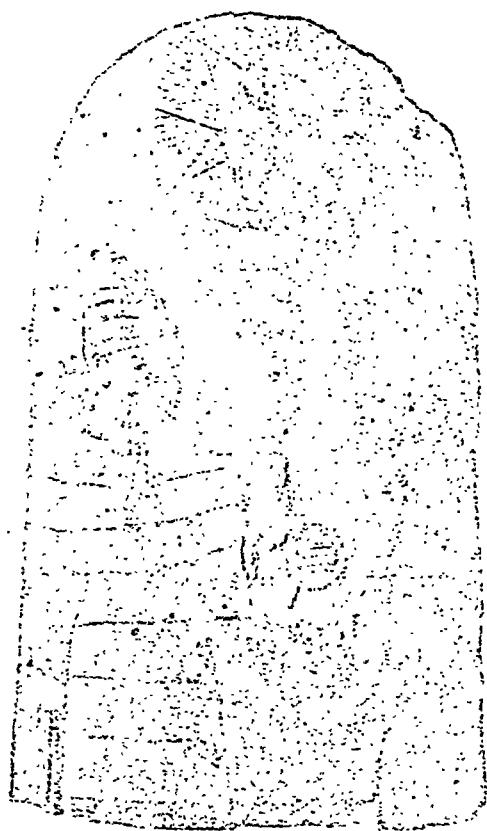
Bread was in thin flat pancakes, piled high on a platter or circular basket-tray; sometimes it was baked with the pernicious darnel to make it more palatable—a dangerous addition, and yet one which has

been countenanced in Europe. Nay, there are actually warnings in those cuneiform tablets, which give the lucky and unlucky days, against eating darnel and the seeds of fennel (or perhaps anise) at stated times. Nevertheless it was a popular risk; some fifteen hundred years later the ordinary rations for a working man for a month were 72 'qa' (about one and a half bushels) of corn, 80 qa of dates, and some salt and darnel.

Like the moderns, the Babylonians probably ate little meat, but there is no doubt that, apart from the priests who would share the good things of the god's table, the ordinary folk were able to obtain it at times; indeed, one housewife (a long time after this period, it is true) wrote to her husband telling him to salt down a piece of meat which was doubtless already on its way to him.

Birds, especially geese, were eaten, and fish, from both the sea and the river, and there was no taboo on either tortoises or shellfish. There was also a kind of sweet-meat made of corn and roses, which is defined as a 'bonne-bouche of the confectioner.' Vegetables and fruit were plentiful, and the poorer folk ate the roots of reeds called 'kungu,' or, as Berosus, the Chaldaean priest of the third century B.C., calls them, 'gongae.' Wine and different kinds of beer were drunk unsparingly; the water of the river was first filtered through a large porous jar standing in a wooden frame in a corner and then put into smaller vessels, also porous, and cooled either by being fanned with a fan made of straw on a handle, shaped like a flag, or by being left out on the roof parapet all night, as in modern Irak.

Besides the table and the chairs the house would have its wooden boxes, its beds and even a wicker bird-cage, containing some unfortunate corpulent sand-grouse. A niche in the wall served as cupboard; then there were the unglazed clay pots (for glaze on pots does not come in for some centuries yet), and copper implements and pots, and corn rubbers of flat stone slabs, now worn concave with much rubbing beneath the stone muller, and some form of charcoal-brazier for the cold of winter.



ROBES OF A BABYLONIAN KING

The typical costume of the age of Hammurabi consisted of ample garments of heavy woollen material. Here we see the great lawgiver himself wearing the characteristic long tunic, flounced but tight-fitting, and in this instance with a series of little capes on the shoulders.

The Louvre; photo Giraudon

Consider the outlook of such a noble on life about 2000 B.C. First, his political views were limited to a small compass, owing to the narrowness of his world, a narrowness due to the lack of means of travelling either far across difficult country, or fast to escape from his foes by the wayside. All this was shortly to be changed, but as yet the factor which was to bring it about—the horse—had barely been introduced into the country, and consequently little was known of distant lands. Presently, within a bare five centuries, the great powers of the ancient world, Egypt, the Hittites, Syria, Mitanni, Assyria and Babylonia, were to discover each other, exchange ideas in cuneiform writing on clay tablets, and send gifts and even wives each to his good brother and neighbour.

But the time was not yet : Babylonia must needs pass through many vicissitudes before the Kassite mountaineers could establish themselves on the throne, swooping down from the mysterious mountains of the East, always a source of terror to the Babylonians. Now and again a king in Babylon would achieve greatness as a conqueror, Hammurabi to wit, or at later dates either of the Nebuchadrezzars ; but more often they preferred to make pious offerings to their gods, and lead peaceful lives, and so unwittingly draw down upon themselves the lust of conquest by more hardy races.

Secondly, there was his outlook towards his own people. He, as a town dweller, looked with no little contempt on the nomads of the desert, and here he was convinced of his superiority, just as the Arab of all times has believed the converse. Even in an early edition of the great Babylonian epic which tells the story of Gilgamesh, the writer at this very period has introduced the theme.



WHEN THE KING'S RULE WAS LIMITED TO HIS CITY

Before Hammurabi's conquests, Babylon had no pre-eminence among Mesopotamian states ; one of its early kings (anonymous, c. 2200 B.C.) is seen on the right. During this period Elam was a greater power than an Elamite prince, Warad-Sin (left), having been installed as king of Larsa (2167-2155 B.C.)

British Museum

Gilgamesh is the tyrant king of Erech, and this theme of the great difference between the town and the country runs through the first part of the epic, in the stanzas which lead up to the tremendous combat between the king and a wild creature of the desert called Enkidu. Enkidu is a rough, uncouth fellow, created from a clod by the goddess Aruru, who spends all his life in the wilds until such time as his mate, the singing-girl with whom he has fallen in love, entices him into the city of Erech that he may fight Gilgamesh.

In this incident, as the story tells it, there is on the one hand the little gibe of contemptuous civilization at the bucolic

simplicity of the savage; to quote the exact words of 2000 B.C.:

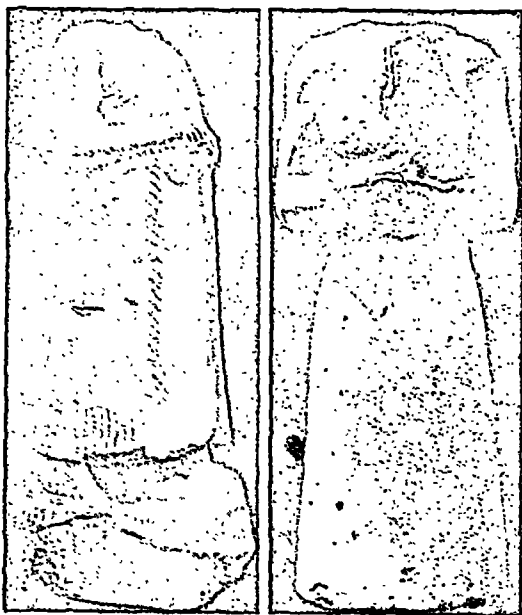
The bread which she had set before him he broke, gazing, aye, staring: Enkidu knew not how to eat bread, to drink mead he had not been taught.

In good sooth, as the text says, 'he had been wont to *suck* the milk of the animals.' Then, when the girl tells him that bread and meat are the proper concomitants of civilized life, he gorges himself and drinks his fill of seven bumpers of mead, which have the effect of 'freeing his spirit,' and finally when he dons civilized garb 'he becomes like a man of good estate.'

On the other hand he, like the Arab, holds the view that life in the open air is the only life fit for a man, and, fired by the blandishments of his help-meat, declares that he will challenge even Gilgamesh himself to battle:

I, I will summon him, challenging boldly, and crying through Erech, 'I too am mighty.' Nay, I, forsooth, will Destiny alter, (for, truly) 'tis he who is born in the desert whose vigour is greatest.

This, however, was merely the natural feeling between townsfolk and provincials. There was a far more serious division of



HOW NOBLES DRESSED IN ASSYRIA

From the nobility the state departments and learned professions were recruited. Of these two nobles of Ashur, he on the right is of Hammurabi's period; the other, although his costume is so similar, lived about 200 years earlier.

From *Andrae, Kunst des Alten Orients*

the people into castes, recognized by law, and due perhaps to the gradual upheaval caused by the decadence of the Sumerians. The man of the upper class was called 'amelu,' a title which comes to signify merely 'man.' The man of the middle class or plebeian was called 'mushkinu,' a word which reappears to this day in Arabic, usually meaning a poor man, but in southern Arabia as a very special epithet implying something not so far remote from the Babylonian word; and to this day it is to be seen in the French 'mesquin.' The third class were the slaves.

It does not appear that slaves were a hardly used class in Babylonia. Slavery was an institution which went back for certain almost a thousand years before the time of which we speak, but the ordinary Relations between noble does not seem to masters and slaves have possessed an undue number of them. Moreover, the relations between such a noble and his slaves were so intimate that he could both discuss his most confidential affairs with a chosen manservant, and be prepared to add a slave girl to his harem.

One of the most amusing little sketches in cuneiform is the Dialogue between a Master and his Slave, in which the attitude of the former is that of a debonair egotist ready to speak of his intentions, whether to travel, go to worship, marry, or what not, while his servant, a genial ruffian, heartily subservient, is quick to seize his lord's fleeting moods and fit his answer to accord with whatever weather-cock undertaking the great man may suggest:

'Hearken to me, slave.'

'Ay, master, ay.'

'Hasten, fetch me water for my hands, give it me, that I may dine.'

'Dine, master, dine: to dine regularly is the opening of the heart: with [a meal?] eaten in joy of heart and with washen hands the sun cometh.'

'Nay, slave, I will not dine.'

'Dine not, master, dine not; for fasting and eating, thirsting and drinking, come (ever) on man.'

And so on, until we come to the master's matrimonial intentions:

'Hearken to me, slave.'

'Ay, master, ay.'

'I will go love a woman.'

'Love, master, love : the man who loveth a woman forgetteth woe and wretchedness.'
'Nay, slave, I will not love a woman.'
'Love not, master, love not : a woman is a pit, a hole, a grave, a woman is a sharp iron sword which will cut a husband's throat.'

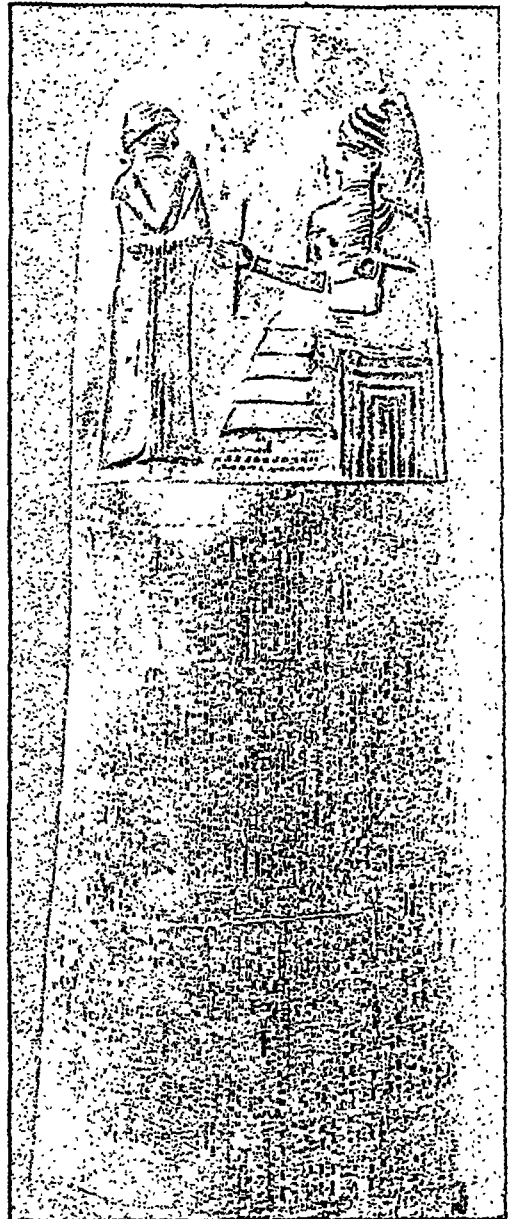
Actually a slave, although he was his master's personal property and was so marked on his body, either by branding or tattooing, had certain rights. He was liable to be called out, it is true, for the 'corvée,' he might be sold or pledged for debt, and his property belonged to his owner. Also if he ran away it was a crime to give him sanctuary, and a fixed reward was paid for his recapture.

Still, if he married a free woman, his children would be free, and moreover both he and his wife could acquire property, the half of which his wife and children would inherit. If such a 'seigneur' as we are discussing took a slave girl into his harem, and she bore him children, both she and they would be free after his death.

Life for one of the upper class nobles about this time was easy, particularly if he were one of the secular officials and had nothing to do with the church. Hammurabi had left his mark on the land both as a lawgiver and as an anti-ecclesiastic. On the one hand he had re-edited the old laws, and had set up

his version on a wonderful pillar of diorite, known as the Code of Hammurabi, which was in subsequent years to be carried off as a trophy to Susa, over the Persian border, in some campaign. On the other, it seems to have been due to his influence that the old Sumerian 'patesi' or 'ishakku,' the prince-priest, once so powerful, was reduced to the lower grades of officialdom, showing thereby Hammurabi's determination to be king, and to brook no interference from the priests.

He, the unifier of Babylonia, was a king in good sooth, the supreme head of the land, and it is in his time that we see a rapid decadence of the power of ecclesiastics in the law-courts, for where in the past the priests had had the right of judicial decision, the judges were now secular. Only, while ensuring the shearing of the influence of the church, he took



EARLIEST KNOWN CODE OF LAWS

Engraved on a stele piously decorated with a representation of the king receiving the laws from Shamash, the sun god, Hammurabi's Code throws the clearest light on Babylonian society. In 182 paragraphs it summarises existing laws.

The Louvre

good care to retain the great religious perquisite which his position allowed him ; he never relinquished his ultimate right to deification, obviously so very much to his advantage.

But Hammurabi, obsessed with his own pride as a lawgiver, had evidently

deposed the priests in order that he himself might exercise to the full the power of adjudicating in the final appeal, and the numerous letters extant from him to officials in this strain show how deep his interest was. Our noble, for instance, if he had been one of the numerous local

Judicial System of King Hammurabi appointed to outlying towns, a mayor with the title of 'rabianu,' and with full power in his own civic court as chief judge, would have had to reckon with perpetual interference from the Throne, albeit there appear to have been one or more courts above him in which a case would be tried before the final appeal to the king.

Yet there can be very little doubt, in spite of the irksomeness of the continual reminders of royal authority, that the country under Hammurabi must have been very well governed. The law gave great power to the judges, and the penalties laid down seem to us to have been very severe, rape and certain cases of robbery, incest or adultery being punishable by death, while sixty blows were given for striking a superior; the principle of the 'lex talionis' was in force, and fines were frequently imposed. It was exactly in keeping with the king's character to include in his code the proper fees and wages for the different professions and trades.

In just the same way, the king was head of the army. If our noble had been one of those officials entrusted with the duty of finding soldiers, known as a 'rid sabi,' he was at the king's command, and might have to be absent from his family on service for long periods. If he shirked it, and tried to send a substitute, he was liable to be put to death. As for the internal organization of the army at this time, or the subordinate commands, we know little; Hammurabi's troops certainly included 240 men of the King's Regiment, and now and again we come on little glimpses of military movements in the letters.

One deals with the distribution of troops and the enrolment of the men of Malgum; another reports a defeat, and asks for officers, 'that the 500 soldiers

from Sakdainpa and the 500 from Adab may hold the fort'; a third sends orders for 90 men to be transported by boat from the troops round about Ur; a fourth deals with the issue of kit (clothes and headbands), oil, etc. A legal document records how a man who had been a slave in a foreign land ran away home after five years, and was promptly made liable for military service; but on his plea that he was going to carry on the service of his father's house, he was exempted.

As for the police or gendarmerie, they appear to have been under the orders of local commanders, the central government having a right of indicating their employment in case of need. This is inferred from a letter which orders the recipient to post a gendarme to make certain that a due amount of 'grain is handed over to its owner.

Turning now to the family life of such a noble as we have been discussing, we can speak with fair confidence of the matrimonial customs in vogue. Youths and maidens fell in love, as at all times and in all lands, and the young man would seek aid from magic, if we may infer anything from a cuneiform love-charm extant, which certainly points to the young

*Courting days of
Babylonian swains*

man's fancy straying towards some particular, though coy, damsel. But actually we do not know how much it was customary for the young people to see each other before the match was arranged, or whether the middling-gossips arranged it all; and yet there is no little hint of moonlight courtship in the song a lover sings to his lass, 'Love is a lamp to lighten an eclipse,' or the lovelorn damsel's song, 'After I have lain in the bosom of my dear.'

Unless Babylonia was very different from the rest of the world, Ruth and Rachel had their counterparts among the maids of Babylon, and Thisbe's story is a true picture of what might have happened amid the yellow brick bastions. After all, surely the ladies of Erech might take a leaf from the book of their patroness and goddess, the goddess of love, the great Ishtar, who did not disdain to propose marriage to the hero, Gilgamesh,

albeit he spurned her love, not, in sooth, on the grounds of unmaidenliness on her part, but because she was like to make him a bad wife.

Whatever the preliminaries, however, the first official step of our Pyramus was to bring his prospective father-in-law a present, a relic of days long gone when men bought their brides. Then came the formal contract before witnesses, for the law lays down that the bride without her marriage lines is no wife; doubtless the bridegroom followed the custom of which we are told in the later laws, and plighted his troth in the presence of his friends, taking his veiled bride with the words, 'She is my wife.' No oriental wedding was ever complete without music and feasting, and the staccato cacophonies of dulcimer, harp, drum and pipe pursued the crowd of merry-makers.

It was the part of the bride's father to give his daughter a dowry, and woe betide him if he forgot, as just such an one did in actual fact, so that he must needs write off to his friend: 'I am giving my daughter to a husband, and I have nothing to give

Financial Element her (as dowry) . . .
in marriage customs Let him go out and buy for me two slaves and three maids (and) have them delivered to me, please.' We hear of a lady receiving a slave girl, two shekels' weight of gold for ornaments, head-bands, clothes, a corn-grinder, copper implements, chairs, even a parasol, and besides all this a well furnished house and garden; an unusual addition, for it was customary for Pyramus to lead Thisbe back to his father's house.

If by any chance after the preliminaries had been settled the lady's father changed his mind about giving the suitor his daughter, he was mulcted in twice the value of the present the young man had brought; if it was Pyramus who jilted his lady-love, then he must needs leave the present in her father's hands.

Thisbe's position as a wife was secure in her own house, although the Babylonian proverb makes it clear that 'grey mares' were not popular: 'A house without a master is like a woman without a husband.' Only if she turned out to be perpetually

ailing might her husband take a second wife with full rights; otherwise he might marry a secondary wife, and might add a slave girl or two to his harem, but none in fact would be likely to oust Thisbe from her position. Even if she had had a sister who was also taken by her husband in marriage, the two ladies would not be on the same level; it would have been stated in the marriage contract that one was definitely inferior, and to mark this she would have to wash her sister's feet, and carry her stool to the temple.

But there was the old, unfair treatment of woman as against man in the law, should either weary of the other. Divorce was **Divorce easier for easy for Pyramus, difficult for Thisbe;** **Men than Women** for he

could divorce her for no fault of her own, by merely returning her the dowry which she had brought with her, or, if she had brought nothing, by sending her away with a gift of money. If she turned out to be a featherbrain without care or thought for her household, she risked losing even this dowry when her impatient spouse turned her out. If on the other hand he ill-treated her, it was considered good reason for her return to her father's house. Adultery on the part of the husband with another man's wife was not only rebuked in the moral texts as a grievous sin, but rendered both the offenders liable to death by drowning, with this proviso, that a husband might forgive his errant wife, or the king 'save his servant.'

Here it is fitting to turn aside for a moment and discuss the position of women in general at this period, and in particular contrast their lot with that of women in Egypt. It is no easy task, however, for evidence, which may be ill proportioned or not contemporaneous, may lead us very far astray. Still, we can follow the attitude adopted by men towards their womankind in both countries with fair parallels, although they actually form too slight a basis on which to build high.

First and foremost it must be conceded that we should leave such preconceived ideas behind as would lead us to infer anything from the modern and retrogressive views of many orientals about their womenfolk. We have no right to

attribute such a monstrous outlook to the two great nations of antiquity until we are brought definitely face to face with it. Speaking broadly we may say that the men of both nations respected and loved their women, but if comparison be possible

we must award a slight
Women's lot in superiority to the
Babylon and Egypt Egyptian. There is a
 soupçon of approxima-
 tion to the early nineteenth century
 epithet, 'females,' in Babylonian ideas
 which is not so perceptible in Egypt. This,
 however, appears to be the nearest they
 would go towards the modern Arab's
 contempt for women.

Consider first the filial piety of the two. Here is an Egyptian's exhortation to his son to treat his mother kindly :

Multiply the loaves which thou givest to thy mother, and carry her as she carried thee. When thou wast a heavy load she carried thee often . . . When she brought thee forth after thy months [were fulfilled] she set thee like a veritable yoke on her neck, and her breasts were in thy mouth for three years. . . . When thou art a young man, and dost marry a wife, and art the master and possessor of a house, I pray thee to consider thine own childhood, and how thou wast reared, and to do for the child that shall be born to thee everything that thy mother did for thee.

Herkhuf (Sixth Dynasty) describes himself as one 'beloved of his father, approved by his mother.'

The Babylonians seem perhaps to have been less demonstrative. Gilgamesh can go to his mother for help to interpret his dreams, but it has to be admitted that his conversation with her is merely courteous ; and it would appear from contract tablets that a woman would anticipate her death by handing over her property to a daughter in return for maintenance during the rest of her life, a custom which compels us *regretfully* to recognize the Babylonian business element even in filial piety. There is, however, no question about the love of a Babylonian mother for her son, or the duty of a son to his mother.

The mother of Gilgamesh, a goddess, distraught by anxiety on his account when he is about to set forth on his hazardous quest, mounts to her roof whence she can see the Sun clearly, and upbraids the god with having given such a restlessness of

spirit to her son, which is going to lead him into such danger. But in spite of what we know of Babylonian filial duty, we see no inkling here of any reciprocal feeling of sorrow at his departure in Gilgamesh, and when he has slain the divine bull, it is to Lugal-banda, the *gōd*, who has certainly great claims to be his father, that he dedicates the horns. In general, however, we must accept filial piety as one of the Babylonian virtues : the tablet of moral instruction prescribes that 'he who doth not reverence his father goeth speedily to destruction,' and the old laws are insistent in condemning to slavery the son who says to his parents 'thou art not my father, thou art not my mother.'

There is the same nuance of Egyptian superiority in the relation between husbands and wives. The love of an Egyptian husband for his wife appears to have been great, as can be inferred from the number of times both are represented together on the same group of statuary. The wife accompanies her husband on his holiday trips, and even kings have no shyness about their sculptors or painters recording their little marital tendernesses to each other, while the love-songs which have come down to us breathe all the passion of a later period in Europe. . . .

The parallels from Babylon show less feeling. The sculptures rarely include conjugal scenes, but a later Assyrian relief shows the queen of Ashurbanipal feasting Comparison of
 with her lord ; yet the Conjugal Relations
 whole picture is one of restraint, and there is nothing like the camaraderie obvious in the charming and touching Egyptian groups. The advice which Siduri gives to Gilgamesh, 'Cherish the little one holding thy hand, and let thy spouse be rejoiced in thy bosom,' is almost cold beside the words of the Egyptian Ptah-hotep :

If thou wouldst be wise, stablish a house for thyself. Love thou thy wife in the house wholly and rightly. Fill her belly and clothe her back : oil for anointing is the medicine for her limbs. Make her heart rejoice as long as thou livest ; she is a field profitable to her lord. Enter not into disputes with her. She will withdraw herself before violence. Make her to prosper permanently in thy house—

There is something dispassionate in the description of the mourner, afraid of the return of the ghost, in the Gilgamesh Epic :

Thy wife whom thou lovest, thou hast not kissed,
Thy wife whom thou hatest, thou hast not struck,
Thy child whom thou lovest, thou hast not kissed,
The child whom thou hatest, thou hast not struck,

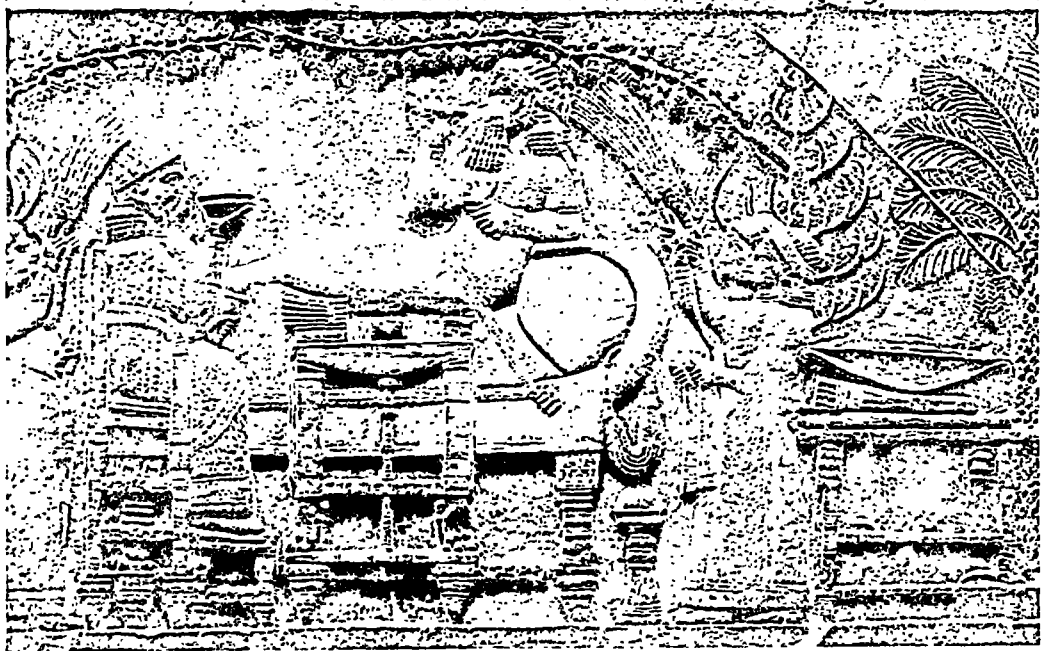
Whence he fared forth, may return.' Spake unto her Uta-napishtim,

Yea, to his wife : ' (How) the troubles of mortals do trouble thee also !

Bake, then, his flour to put at his head, but while he is sleeping,

On the house-wall do thou collect (?) it.'

This impersonal reference to a wife is, however, used in the Egyptian Tale of Two Brothers.



POMP AND CIRCUMSTANCE EVEN IN THE INTIMACY OF PRIVATE LIFE

Judged through their art, the Babylonians and Assyrians appear to have been by nature reserved. Their ordinary marital relations, for instance, would seem to have been more rigid and formal than in Egypt—as is suggested by this relief of King Ashurbanipal (669-626 B.C.) feasting with his queen. Though one might have expected some abandon—they are celebrating a victory 'al fresco' beneath the vines in a garden—it is marked by more than a touch of ceremony. Compare the Egyptian paintings of Akhnaton and his queen and daughters in Chapter 24.

British Museum : photo, Mansell

and there lurks a touch of Arab offhandedness in the colloquy between Uta-napishtim and his wife, whose name is not given. She takes compassion on Gilgamesh, who has suffered so much, and is now lying asleep, worn out with toil ; but although she plays a sympathetic part of no little importance, she is referred to only as the wife of Uta-napishtim :

Then his wife unto Uta-napishtim, the distant,

Answer'd : ' O touch him, and let the man wake, that the road he hath traversed

He may betake himself homeward in peace ; to his land, by that portal

If there really be this difference between the two lands in their appreciation of women, we shall not be far wrong in seeing its genesis in the marriage customs. In Egypt a brother might (and often did) marry his sister, while such a relationship would have been impossible in Babylonia. This would indicate a difference in the upbringing of the sexes ; in Babylonia it would appear that the sons and daughters were separated at a fairly early age, the son to follow his father, the daughter her mother :

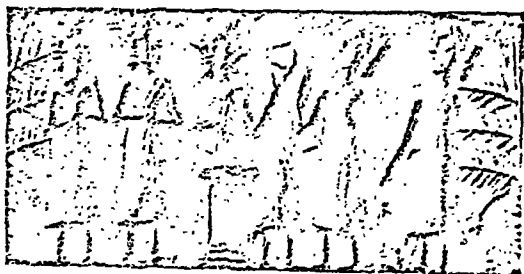
Never a son to his father doth Gilgamesh leave (in his freedom) . .

Gilgamesh leaveth no maid to her mother,
nor daughter to hero,
(Nay), nor spouse to her husband.

Yet we cannot in all fairness afford to stress overmuch this difference which, after all, appears to be only a difference in the ideas of demonstrativeness. The ordinary letters of every-day life between men and women would give the lie to any slander that the Babylonians were not as fond of their wives as other folk. A little tablet of this date which was sent by one Gimil-Marduk to his lady Bibiya in Sippar (not much more than a day's ride north of Babylon) shows how homesick he was :

May the gods Shamash and Marduk give thee health for ever for my sake. I have sent (to ask) after thy health : let me know how thou art. I have arrived in Babylon and see thee not ; I am very sad. Send news of thy coming that I may be cheered ; in the month of Marcheswan thou shalt come. Mayst thou live for ever for my sake.

Fifteen hundred years later, in neo-Babylonian times, husbands travelling abroad were equally heartsick at their



DEDICATED TO A GODDESS

Among the most honourable careers open to Babylonian women was the service of religion, and many seem to have entered upon it. Here we see four priestesses of Bau-Gula, two before and two behind a figure of the goddess.

From De Sarzec. Découvertes en Chaldée

long separation from their wives. 'Why,' writes one, 'hath news of thee to me been delayed, and why have I not seen a single answer to all the letters I sent thee?' 'Why, pray,' writes a vigorous dame to her man, 'am I and my daughters to pass the time thirsting for a letter from thee?'

The expected advent of a child to the newly wedded pair was hailed with delight, and there is a letter extant, later by many hundred years, it is true, than this period, but none the less representing the thoughts of every Semite. It comes from the ex-

pectant father to his wife : 'An abomination to the gods (in sooth) ! Why have I had no news from thee ? My heart rejoiceth that thou art to become a mother.'

After a child was born he had no rights, and when he grew up the father could pledge him for debt like a slave ; time had been when he could disinherit him arbitrarily, but this had been done away with by Hammurabi, who made a legal process and the adducement of a good reason for such a stern course compulsory.

With the payment of a dowry, a daughter might be dedicated by her father to a temple to be a priestess, and this seems to have been one of the highest professions for women. It is true that women

Highest profession open to women

might carry on various trades, even that of a scribe, and might conduct business transactions or act as witnesses to documents, so great were their privileges and liberties ; but when we find Nabonidus, the last king of Babylon in the sixth century, dedicating his daughter as a priestess of the Moon in Ur of the Chaldees, it is clear that a priestess must have ranked very high in the social scale.

The most important priestess was called the 'Bride of the God,' and after her came several priestesses who appear to have been secondary wives of the god. They lived in a charming little convent in the temple, and so careful had they to be of their reputations that they incurred the penalty of being burnt alive if they even entered a wine tavern. Although it is uncertain whether the 'Bride of the God' married a human husband also, there is no doubt that the secondary wives did ; but, curiously enough, they were not expected to bear their husband children.

To these two classes must be added a lower one, that of the temple prostitutes, particularly in the train of the goddess Ishtar at Erech. To one class of these it was customary for Babylonian ladies, and even women of the poorer class, to put out their babies to nurse.

When the father died, the widow and the children inherited his property, the sons taking equal shares, and the widow, besides her share, taking back an amount equal to her marriage portion ; daughters

who had had dowries were excluded, but if they should not yet have received anything it was for the brother to give a marriage portion.

So much for the more serious side, the responsibilities, of a man's life. What were his amusements?

As a baby, he began with a clay rattle. Then, when he had grown a little he had tops to whip, and knuckle-bones to play with, as can be verified from the Carchemish sculptures; and so, a little later, came riding, shooting with the bow, hawking, hunting, feasting with music. Then there were the religious festivals, especially the Feast of the New Year; and we might not be far wrong in thinking that something resembling plays were acted, like the Song of Solomon, perhaps even the Gilgamesh Epic. There appears to have been, even in early times, a common meeting house in the community for men, just as an Arab village in southern Mesopotamia will have a large reed hut set apart in which the men are to be found drinking coffee and eternally reiterating the futilities of illiterate village conversation.

The man had always the means, at least as early as the seventh century, of artificially banishing sorrow by taking 'binj' or hemp, although there is nothing to show that such a vice was common, and if he drowned his sorrows in wine, for which there were ample opportunities and a bad example from the gods, the physicians were ready with a selection

from their thousand-and-one remedies to relieve the subsequent results.

But it was the bazaar which held all the life and movement of the city. Hither came the merchants with their caravans from far countries, bringing the gossip of a hundred strange cities; here would you find scribes ready to draw up a deed for every form of contract necessary. Would you rent land? Then you can lease it on



PASTIMES BELOVED OF CHILDREN

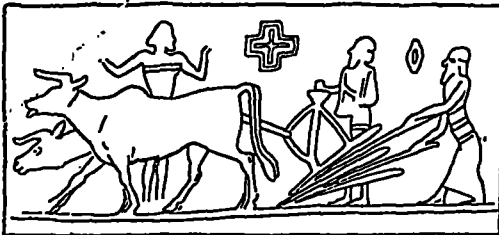
That certain toys were very early evolved is proved by this lively relief at Carchemish. We see two youthful members of the royal family engaged in a game of knucklebones, while others are whipping spinning tops; these must also have been known to the children of Babylonia.

Photo, C. Leonard Woolley

the 'metayer' system from the owner, who will lend you the animals and seed and take his profits from your crop; or you can rent it at a fixed rental, usually for three years.

But you must see that the canals are in good order, for no crops will be satisfactory without water, and if you own land on the banks of a canal going to rack and ruin, it is as likely as not that the king himself will write to the governor, and he will put you to that most exacting of 'corvées,' the clearing out of a muddy watercourse. Then you must have the land broken up: time was when men did it with stone hoes, and if you look about on an old site you will still find their tools; but now, of course, men have ploughs, simple enough, drawn by oxen, with the seed running down through a little tube.

You can grow barley, spelt, sesame and millet; or if your land is near the river, date palms are a most profitable invest-



EARLY LABOUR-SAVING MACHINE

By means of this seeder the Mesopotamian farmer could accomplish two operations at once: it ploughs a furrow and simultaneously deposits grain in it. A labourer beside it pours the seed into a funnel, whence it trickles to the ground.

After A. T. Clay, University Museum, Philadelphia

ment, a very ancient form of arboriculture, going back certainly to 2800 B.C. You could have your choice of numerous varieties, but you must learn the tricks of artificial fertilisation, of fructifying the female palm with the pollen, another ancient piece of ingenuity which dates back, as some think, to the time of Gimil-Sin, a king of about 2350 B.C. Ultimately this method developed to such an extent as to be a source of trouble to the learned oculists of Babylonia—because the pollen got blown into people's eyes—and the doctors included this as one of the causes of ophthalmia in their medical works.

Few trades were unrepresented in the bazaars. Apart from the hucksters in their booths selling the products of others,

there were the guilds of craftsmen. Coppersmiths made pots and pans with the same clangour as they do in Bagdad to-day, and they, like the goldsmiths, were banded in a guild under a master-craftsman. Tailors used flax and wool, the women spinning the thread on spindles. Potters, even in Sumerian times, were able to turn cups in a very delicate thin ware on the wheel, and their favourite shape for a waterpot was made with a spout at the shoulder. It was the potter and his dog that gave rise to the Assyrian proverb, apparently typifying ingratitude, which spread into the West, even to Syria: 'The potter's dog, once let him get into the oven, will snarl at the potter.'

Bakers baked with flour which had been rubbed by hand between two stones, adding their leaven from the previous day's batch. The loaves were either in a flat pancake shape, and were baked by being tossed through an opening in the shoulder of the dome-shaped ovens to adhere for a minute to the heated wall inside; or else they were cooked in the ashes, Arab-fashion, and therefore called 'ash-bread.' Butchers must have killed many animals to provide the skins necessary for water-bottles, and rafts, and the leather for shoes, drums and military equipment; but meat would be a luxury, and not much eaten by the poorer folk. The tanners worked up the hides into leather with gall-nuts from the dwarf-oaks of the hills, which to this day retain their ancient name 'belût,' and

with sumach, an essential in their trade for colouring the leather. As an instance of the tenacity of habits, the people of Aleppo to this day chew the sumach seeds to give them an appetite, and this same little detail is mentioned on a cuneiform tablet of the seventh century.

Carpenters and shipwrights, though hampered by lack of wood, could build massive gates and ships capable of carrying ninety men; stone-masons were equally limited by want of material, and yet they were good sculptors. Experts could glaze beads with a frit of sand and alkali made of the soda-plant, *Salsola kali*, growing near the sea. Dyers apparently used woad for their blues, saffron and turmeric for their yellows and probably safflower for red. All these treasures were to be bought, not for coins, since coined money was not yet, but for silver given by weight, the units being the 'mana' (about 18 oz.) and the shekel, a sixtieth of the mana.

So much for the material side of life in Babylonia; it remains for us to consider the spiritual conceptions.

Religious belief was certainly genuine in Babylonia, and no one appears to have doubted the existence of the gods, although equally no one would deny that some gods were more powerful than others, and that limitations of locality would affect their capacity to help men. Re-

ligious observance, too, was not only a state institution, in which the king and the

priests and their numerous following played an important part, especially at the great festival of the New Year; it was very definitely individual and personal, as we shall see from the legends, from the private letters of the common folk and even from a scene on some glazed ware, of a man and his wife before an altar. It remains a factor for conservatism down to the end.

In the beginning, when each tribe worships its own local god with all the attributes of a tyrannic human being, there are as many deities as there are tribes. Then, as a gradual centralisation of the tribes takes place under one head, the natural tendency is to recognize one of the gods as particularly prominent above all the others, who either take a subordinate

position or drop out of remembrance altogether.

Such was the case at Babylon ; hitherto, under the Sumerians, each city-state had had its own tutelary deity, but, with the welding together of the Babylonian kingdom, Marduk, the chief god of Babylon, rose to high popularity, just as subsequently Ashur was to take pre-eminence in Assyria. This, however, did not prevent the continuance of the worship of other gods, although their prestige had suffered a partial eclipse ; the Sun god (Shamash) would always retain his worshippers at Sippar, the Moon god (Sin) at Ur, Nabu at Borsippa.

Nay, not only would the inhabitants of any large city worship their own city god, but also, recognizing the right of other gods to exist, would frequently welcome the building of small shrines to them in their midst. It is this local variation in renown which makes it impossible to ascribe the entire hegemony over the Babylonian Olympus to any one god.

As we have hinted, the Babylonian Semite owed much of his religion to his Sumerian predecessors, and through him many gods and goddesses who were worshipped by the Sumerians were introduced to other Semites, and incorporated in

their several religions, ultimately reaching Egypt, Asia Minor, Greece, Rome and even Britain. Two great triads of gods stand out prominently, although, perhaps, the division (which is mentioned by Porphyry, a Greek philosopher of the third century A.D.) is not a very ancient one ; these are, first, An (Anu), Enlil and Enki, and secondly, Sin, Shamash and Ishtar.

Anu is god of the sky, known as the ' King of the Gods.' By the Semites of Hammurabi's time his wife was known as Antu, merely a feminine counterpart of himself. The home of both Anu and his daughter Ishtar was the city of Erech, where they dwelt in a temple of high antiquity. The second of the triad, Enlil,

whose name is given as Illinos by Damascus, a Syrian of the fifth century A.D., was called Bel by the Semites ; he was probably originally a lord of the air or wind. He was called the ' Great Mountain,' which points to a connexion with the winds or upper air, doubtless on account of the cloud-capped peaks and slopes. His chief wife was Nin-lil, the ' Great Mother.'

Enki (or Ea, as the Assyrians called him) appears originally to have been lord of the Earth, but in the sense of the ground



SUMERIAN EMPEROR WORSHIPS THE MOON GOD

Ur was the great city devoted to the worship of the moon, whose name in Sumerian was Nannar or Enzu and in Semitic Sin. Strangely, he usually took precedence over the sun god, who was fabled to be his son. This seal shows Ur-Engur, of the Third Dynasty of Ur, paying his respects to Sin.

From the British Museum

out of which the hidden waters flow. He is particularly the god of the great waters, the sea swamps and tidal lagoons of the south, where lay his capital, Eridu, one of the earliest Babylonian cities. His father was Anu ; and his son, Marduk, was to eclipse the glory of Enlil during the rise of the first dynasty of Babylon.

Now, of these three, Anu and Enki practically died out with the fall of Babylon in 539, but it was not so with Enlil, whose Semitic name Bel, doubtless in comparison with the universal Semitic Baal, both meaning ' lord,' had no little influence on his survival. Having many points beside his name in common with the local Baals already worshipped in Syria, he was adopted into the later and more western cults.

The second triad of gods is bound up in close relationship to the first. Enzu (Sin in Semitic), the Moon, is the firstborn of Enlil, according to very early inscriptions. He is the father of Utu (Shamash), the Sun, who usually takes a secondary place



UNIVERSAL MOTHER GODDESS OF THE EAST

Ishtar, queen of heaven, promoter of love and fertility, set the type for the mother goddess all over the nearer East. In the great Carchemish wall-relief (right) she stands winged and offering her breasts, while figurines are found on every ancient site; these two are from Ur.

Carchemish statue, C. Leonard Woolley

to the Moon; even in the astrological texts the omens always give Sin the precedence: 'When the Moon and the Sun—'

Ishtar, the equivalent of the Sumerian Ninni or Innini, and the star Venus, is the most important goddess in Babylonia, and is regarded as the daughter sometimes of Sin, sometimes of Anu. She combined the functions of mother goddess, goddess of love and goddess of war, and as the star Venus was worshipped under the name of Dilbat, which is found in Hesychius (fourth century A.D.) as 'Delephat.'

Her abode was with her father Anu in Erech, where, as goddess of love, she was attended by troops of singing and dancing girls, who by the duty of their worship took part in the licentious rites of her cult. In one of her forms, that of mother goddess, she is universal throughout the Near East, from the almost life-size sculpture of her at Carchemish offering her breasts, to the little clay figures, so often to be picked up on Babylonian sites, which

are probably votive offerings from women who desired children.

She is the wife of Tammuz, the beautiful youth Adonis (which is merely a Semitic word, 'lord') who, according to a legend, was killed by a wild boar. Bereft thus of her husband by death she followed him to the Underworld, to rescue him from the clutches of the grim goddess Ereshkigal, and with her departure from the earth all its reproductivity ceased and the vegetation died. Each year was this repeated, typifying the winter and the return of spring as the lovers returned to earth, amid the rejoicings of their worshippers.

Of other gods, Mer (Adad), the god of the weather, was the son of Anu; he was worshipped throughout the Near East with little variation, and as a rule portrayed with three-forked thunderbolt. Nabu, the son of Marduk, was god of the art of writing. Nergal is ruler of the Underworld, a son of Enlil

and husband of Ereshkigal, whose name has survived in a Greek charm.

Each city, as has been said, had its special god and temple, and one of the king's chief duties was to see that temples were built, dedicated and duly repaired and maintained for the benefit of the city-god. Eannatum (c. 2900 B.C.), for instance, carried out his religious duties in this respect with pious solicitude for the patron god and goddess of Lagash, Ningirsu and Nina.



STORM GOD ADAD

Adad, a weather god of the western Semites, became popular during the First Babylonian Dynasty; note the forked lightning that he carries on this Babylonian cylinder seal.

Gudea, who was the ruler over the same kingdom about 400 years later, spared no pains to adorn and beautify the sacred buildings, importing timber from the Amanus and copper from far distant mines, and he has left us the exact details in his inscriptions about the dues which were paid to the divinity in beer, bread, flour and so on, particularly at the Festival of the New Year. Hammurabi describes in full in the preamble to his great code of laws the sanctuaries which he repaired.

The rewards for which both king and commoner looked as a return for their piety were material benefits and in particular long life in this world. None sought for an amelioration of their condition after

Hath not bowed his head, learned reverence, From whose mouth prayer and supplication are withheld.

Not only from the above, but from those manuals of devotion, the 'Prayers for the Raising of the Hand,' is it obvious that religion was a personal duty as well as a state duty :

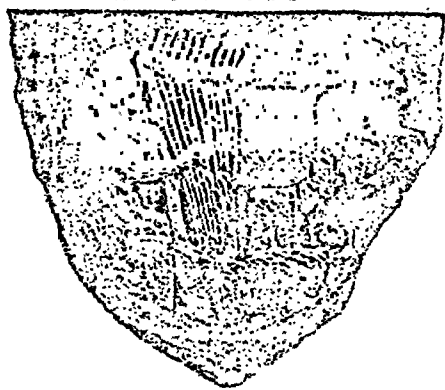
O Tashmetu, goddess of supplication and love, lady of . . .

I, So-and-so, son of So-and-so, whose god is So-and-so, whose goddess is So-and-so, Have turned towards thee, Lady ; hearken to my prayer,

Before Nabu, thy spouse, the lord, the prince, the first-born son

Of E-sagila, intercede for me.

The dialogue between the master and his complaisant slave, from which a quotation



MUSIC IN THE SERVICE OF THE BABYLONIAN DEITIES

It would be presumptuous to claim that the art of music was first worked out in Babylonia, but certainly at a very early date it was brought to a high pitch of elaboration in the temple liturgies. Probably the tunes, like the words, were very old. On the left we see a temple harpist of the time of Gudea, on the right a vase fragment (slightly later) of a priest beating a drum.

From Dr Sarzec, Découvertes en Chaldée, and Revue d'Assyriologie

death by their lavish duty towards the gods while they were on earth, however much they might hope for pious offerings from their descendants, to keep them in decent comfort. Prayer and sacrifice were, in fact, merely safeguards for this temporal life. The king hoped by his devotion to the temple of his god that he would be granted long life ; even the common people recognized that negligence in solicitude for the gods might result in misfortune. The so-called Babylonian Job points to his own trials, as though he, too, had been one who cared not for the gods :

Like one who hath not devoted drink-offering to god,
Or at meat hath not called on the name of goddess,

has already been made, gives further excellent insight into the Assyrian view :

'Slave, hearken unto me.'

'Ay, my lord, ay.'

'Hasten, bring me water for my hands, give (it), that I may make sacrifice to my god.'

'Do, my lord, do. He who sacrificeth to his god will be blessed. Obligation after obligation he layeth (on his god).'

'Nay, slave, I will not sacrifice to my god.'

'Do not, my lord, do not. Thou wilt teach the god to follow thee about like a dog. He will (always) be asking of thee some religious observance, or some . . . or something else.'

That was the cynical and, unless we are wrong, the humorous view taken. Gilgamesh, on the other hand, is quite

genuine, when he sets forth on his quest and imagination pictures to him all forms of terrors on his unknown road :

If 'tis in darkness that I shall arrive at the
Gate of the Mountains,
Meeting with lions, and terror fall on me,
I'll lift my face (skywards),
Offer my prayer to the Moon god.

The very letters written by the common folk, or their scribes, at all events in the later Babylonian period, show their gratitude to the gods for welfare : 'For my own part,' says a man writing to a lady,

Gratitude for well, by the grace of the
heavenly favours gods, as also are all those
who are with me; thou
dost not ask of my trouble, nor hast
thou heard news of me. Ever since the
month of Siwân I have been travelling
to the land of Paniragana (?) : pray Bel
and Beltis on my behalf.' Another from
a lady to a man, perhaps her husband :
'Letter from the lady Puqâ to Iddina-
Nabu, my brother. Daily I pray unto
Damkina and Beltis of Babylon on thy
behalf.'

This piety, always with the hope of being blessed with temporal welfare, leads us to consider the Babylonian philosophy of life and death. The main difference between God and Man in these early theologies is that a god is immortal, while Man is mortal. On this theme of immortality are built the later episodes in the Gilgamesh Epic.

Briefly, the Gilgamesh Epic, a series of legends worthy to rank with the great stories of the world, appears to have had its origin with the Sumerians, from whom it was borrowed not only by the Semitic Babylonians, who certainly had full editions about 2000 B.C., but also by the Hittites of Anatolia, not many hundred years later. It was re-edited by the Assyrian scribes, and echoes of some parts of it are to be heard in classical mythology, and still more in the Old Testament, which appears to have borrowed the Flood legend almost in its entirety.

The story begins with a description of Gilgamesh, the ruler of Erech at some remote period, so terrorising the people that their lamentations reach high heaven, and the goddess Aruru then creates out of clay a wild man, Enkidu,

who is to deliver the people. He is the brother of the wild, feeding and drinking with them and delivering them out of traps ; but one day a hunter spies him, and, returning home, overwhelmed with terror, asks his father how he is to cope with this wild man who frees the beasts that fall into his pits.

The old man advises a visit to Gilgamesh, telling him what the king will say, and so it falls out. Gilgamesh tells the hunter to take one of the dancing-girls from the cohorts of Ishtar in the temple, and lie in wait for Enkidu at the water-pool ; when he sees the girl he will fall in love with her and can then be enticed into Erech. All happens as he says, and the dancing-girl persuades the wild man to accompany her to Erech to challenge Gilgamesh. Their arrival in Erech is marked by great curiosity on the part of the inhabitants, and, as has been mentioned, not without the little dig of the editor against the habits of the wild Enkidu, who is taught how to eat and drink and wear clothes like a gentleman.

During the night Enkidu meets Gilgamesh in the street, and there is a tremendous fight between them, in which Gilgamesh appears to get the worst of it.

Subsequently, they become the best of friends, and set off on an expedition against an ogre called Humbaba, who lives in a forest of cedars which Gilgamesh desires to cut down for

his palace. Ultimately *Epic story of Gil-*
they fight Humbaba, *gamesh and Enkidu*
Gilgamesh loosing moni-

strous strong winds against him, and so overcoming him. Humbaba yields and surrenders himself to the mercy of Gilgamesh, but, at Enkidu's counsel that he is so dangerous that he must be killed, they cut off his head.

While Gilgamesh is washing after the fight, the goddess Ishtar lets her gaze fall on him, and desires him to marry her. He, however, taunting her with her past loves, declines, and she flies to her father Anu, in her rage demanding that he should create a divine bull to destroy the hero. Gilgamesh and Enkidu fight with this bull, and kill it ; and then it is that in some way Enkidu dies, and here begins the quest for eternal life by Gilgamesh.

Man is but mortal, say the sages, and there are at least three passages in the legends which describe Hades. Two are in the Gilgamesh Epic, and the third is in the pathetic story of Ishtar seeking her lost love in the underworld.

Unto the dwelling of gloom, the home of Irkalla,

Unto the dwelling whence come forth none who enter,

Unto the road whereof the traverse hath no returning,

Unto the dwelling where those who enter are reft of the light,

Where their victual is dust, their bread is mud, They see no light as they sit in the darkness.

Burials at this period (of Hammurabi) were made in clay coffins, rather like a bathtub, and the dead, having been thus consigned to the earth, occupied the miserable abode of which the legend speaks. If they were so fortunate as to have dutiful descendants they would feed on libations and offerings. But if nothing was done for them, and the dwellers on this earth made no offerings to them, they would burst forth from the grave and demand their rights, as an incantation against ghosts says :

The gods which seize (upon man)
Have come forth from the grave,

The evil wind-gusts
Have come forth from the grave :

To demand the payment of rites
and the pouring of libations,
They have come forth from the grave.

If their bones were removed from the tomb, the spirits were forced to wander homeless. It was the same if a body was left unburied. Enkidu's wraith, summoned from the underworld, speaks of these ghosts :

The man whose corpse lieth in the desert,
Thou didst see, I see :
His spirit resteth not in earth.

Numerous indeed were the men and women who became wandering ghosts after death : to die of hunger and thirst in prison, to fall into the river and be drowned, to die in childbed, or die a virgin

or bachelor, were all held to be the cause of such misfortune. In any case, these ghosts were able to attack mankind, particularly those who had been connected with them during life (even merely by eating or drinking with them), and it needed all the efforts of a proper wizard to get rid of their baleful influence.

This is the lot of mankind. Gilgamesh, therefore, sets off on a journey to learn how to avoid it and obtain eternal life. He has seen his friend Enkidu die, and the terror of it all has overwhelmed him.

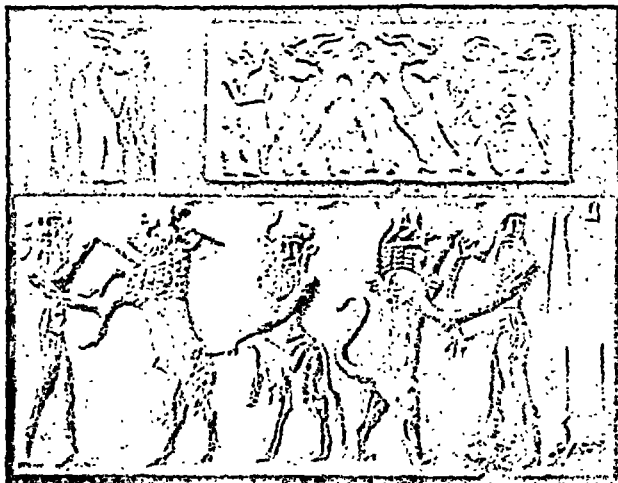
Shall I, after roaming the desert the way of a wanderer (?)

Lay my head (?) in the bowels of earth, and throughout the years slumber ?

O, let mine eyes see the Sun, that I may be fill'd with the sunlight,

(Yea) for the darkness is (banish'd) afar, if the light be wide-spreading

When will the dead see the blaze of the Sun ?



A LABOUR OF THE SUMERIAN HERCULES

A favourite subject for Babylonian seals appears to have been the legendary hero Gilgamesh, tyrant king of Erech. If this explanation is correct, he is either shown duplicated in an heraldic group, fighting a bull or a lion, or else together with another hero (as above) or his satyr-friend Enkidu.

British Museum

On his way he meets a divine maiden, by name Siduri, who warns him how futile it is for man to seek immortality.

Gilgamesh, why dost thou run ? For never the life which thou seekest

Canst thou attain : for the gods in their primal creation of mortals

Death unto mortals allotted, but life they reserv'd in their keeping.

Gilgamesh, full be thy belly,
Day and night long be thou jolly, and each day spread jollity (round thee),

Day and night long do thou dance, and play
 thee tunes on the reed-pipe,
 Clean be thy raiment (and) washen thy head,
 thyself in the water
 Bathe : and be kind to the little one holding
 thy hand : let thy wife, too,
 Joy in thy bosom—for this is the dower of
 Man.

Ultimately he reaches Uta-napishtim, the Babylonian Noah, who had been given eternal life by the gods. The sage tells him the story of the Flood, and how it was that he was so favoured by the gods.

Once upon a time in the city of Shuruppak (the modern Fara), the gods determined to cause a flood, and so destroy the whole of humanity. Ea, however, having compassion on Uta-napishtim, warns him of the approaching disaster, but, as he is in some measure bound not to reveal the counsel of the gods directly to any mortal, the god comes to the reed hut in which he knows Uta-napishtim dwells, and tells the story to the walls, and Uta-napishtim is thus able to hear the warning. He pulls down his house, and with the material, probably the reed bundles of which it was made, builds a boat, and puts all his family on it, with all his property ; then the floods descend and all mankind is blotted out.

Six days and nights did the hurricane,
 tempest (and) deluge continue
 Sweeping the land : when the seventh day
 came were quelled the tempest,
 Deluge, (aye) warfare which, like to an army
 embattled, were fighting.
 Lull'd was the sea, (all) spent was the gale,
 assuaged was the deluge,
 So did I look on the day : (lo), sound was
 (all) still'd and all human
 Back unto clay had return'd, and fen rose
 level with roof-beam.

The ship having grounded, he lets loose first a dove, and then a swallow, but both return ; then he sends forth a raven, which does not return. He then disembarks and offers sacrifice to the gods. The god Enlil, however, who was chiefly responsible for the Deluge, as soon as he arrives, bursts into wrath at the sight of Uta-napishtim, the one man whose family has escaped the universal welter of destruction ; but he is presently appeased by the comfortable words of the other gods,

forgives Uta-napishtim, and gives both him and his wife eternal life. But, the sage continues, Who will summon the gods to dower Gilgamesh in the same way ? None will ; but there is a plant at the bottom of the sea called 'Greybeard-turned-young,' which will make a man young again.

Armed with this information, Gilgamesh goes to the Persian Gulf, ties a stone to his feet like the Bahrein pearl divers, dives in, finds the plant, and carries it off in triumph. But the story-teller, following the correct method of all writers whose heroes discover an impossibility, makes his hero lose the elixir as he takes it home, for a snake darts forth at a pool in which Gilgamesh bathes, and ravishes the plant from his hands.

That is the great story of Gilgamesh, and his futile search for immortality. Such a quest is hopeless. As the Epic says, it is true that we shall for ever build houses and set signet to contracts, while brothers will ever share their property in love, there will be hatred for ever between man, the river which has risen in spate will always bring down a torrent ; and then with a rhetorical question, the Epic asks, Surely may not the face which hath once seen the sun last for all time ?

No ; the lot of man is settled by the gods :

Sleeping and dead like each other—from
 death they mark no distinction,
 Servant and master, when they have drawn
 nigh [unto birth ?],
 Then th' Anunnaki, the great gods, [assemble],
 and Mammetu fateful
 With them (their) fates doth decree, and
 their life and their death doth determine,
 But of the day of their death they have
 vouchsafed no knowledge (beforehand).

There is little or nothing to mark an advance in thought between the time of Hammurabi and the Fall of Babylon ; the Semitic mind, so capable of music and poetry, was too conservative to shake off the shackles of anthropomorphism in a religion in which terrorism played such a part. As we shall see in Chapter 31, the urge of life was based on a material outlook, wherein thought was fettered by an inert conservatism, and consequently, mental development, fed miserably on the past, was starved.

SURVEY OF EARLY MEDITERRANEAN CULTURES

Brilliant Civilizations of which History holds no
written Records revealed to us by Archaeology

By R. A. S. MACALISTER Litt.D. LL.D.

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GEOGRAPHERS treat the Mediterranean Sea as the southern boundary of Europe. This is unsound, both ethnologically and culturally. It would be far more accurate to extend the sense of the word 'Europe' so as to include the land that borders on the Sahara, and to regard the Mediterranean as a vast inland lake, that interrupts the continental land-surface but does not terminate it—as though it were a southern counterpart of the Baltic Sea.

Indeed, the interruption of the land by the Mediterranean Sea is, geologically speaking, recent. So late in geological times as the Pleistocene Period, in certain of its phases, the sea was divided by continuous barriers of land into a series of enclosed lakes. A traveller could at that time have walked dryshod from the continental area of 'Europe' to that of 'Africa' across what is now the Strait of Gibraltar, or else over an isthmus of which Italy, Sicily and Malta are the chief surviving relics (see maps in colour chart facing page 220).

The race among which most of the great civilizations of the ancient world have developed has been settled around this sea, north and south, certainly from the beginning of Neolithic times. In a sense far more than merely physical or geographical the sea has justified its most appropriate name. It is in very truth the centre of the earth, in art, in culture and in religion.

Physically, the Mediterranean race is distinguished from the other races of Europe by its dark complexion, its long, narrow skull and its comparatively short stature and slender build. It is to be seen

to-day in its fullest purity in Spain, but, except in the east, it forms the basis of the populations whose lands surround the sea.

Our knowledge of the actual political history of the shores of the Mediterranean Sea, before 1580 B.C., is of the scantiest. The cuneiform tablets of Babylon, and to a lesser extent the records of Egypt, throw some flickering rays of light upon it from contemporary sources. Classical Greece and Rome have recorded for us some fragments of gossip, telling us what the writers of later date believed about the people who had preceded them. Doubtless these traditions contain certain germs of truth; but we have no very satisfactory winnowing-fan to enable us to separate the wheat from the chaff.

Crete has transmitted to us a considerable mass of documents which must surely contain much of historical value; but she has neglected to accompany her gift with a key **Auditing Cretan** such as would enable us **addition sums** to read them. So far, nothing has been unriddled but the numerical signs which appear on certain tablets that seem to be inventories. These at least have taught us that the Cretan palace stewards could work addition sums; notwithstanding a prejudice against Cretan veracity with which we have been brought up, we can audit them and find them correct.

On the other hand, a long series of brilliant archaeological discoveries has established the broad lines of the history of culture round the greater part of the sea. Two great empires, those of Crete and of the Hittites, have been restored to their place in history by the labours of our

own generation; in addition to which, from Spain to the Euphrates, facts have been accumulating with such rapidity that it is hardly possible to keep abreast of them.

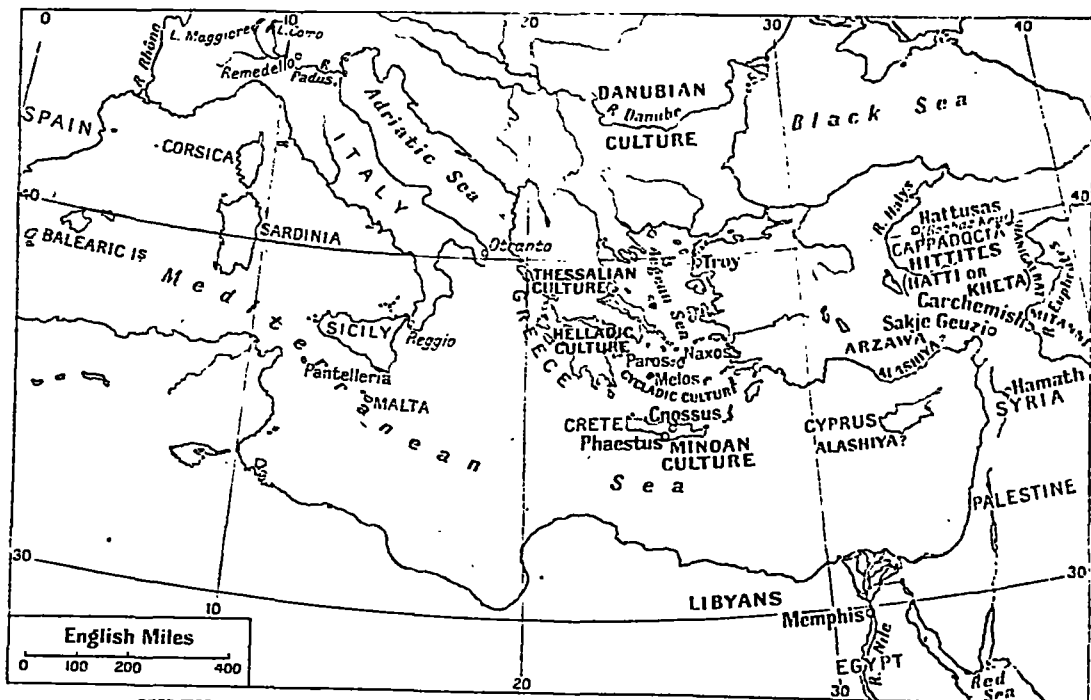
The details of the artistic products of Crete and of the Hittites, as seen in their final development, belong to other chapters of this work; the art and civilization of the Hittites are discussed in Chapter 23, of Crete in Chapter 25. In the present chapter we must content ourselves with generalities, taking a bird's-eye view of the regions bordering on the sea, and endeavouring to learn something of the formative processes that led to their imposing development.

It must be said at the outset that, rich though the archaeological harvest of the twentieth century has been, it is as yet incomplete, and leaves large gaps in our knowledge. Some of these gaps will perhaps never be filled. Archaeological evidence is always necessarily incomplete. Wood, textiles, the perishable materials of the majority of written documents, these cannot survive the corrosion of time

except in unusually favourable circumstances. The prevalence of cremation in certain regions and archaeological periods has destroyed an incalculable amount of valuable ethnological material, over vast tracts of both time and space.

Many of the areas, too, with which we are concerned, for all the activity of recent archaeological research, have been as yet very imperfectly explored. This is especially true of Asia Minor, a region of which the archaeological and historical importance is fully realized by scholars, but of which the exploration, retarded by numerous practical difficulties, has as yet only begun.

Of the Palaeolithic age in Asia Minor nothing is known save the bare fact that it existed. A few implements resembling European palaeolithic tools have been picked up at Uzal, south-east from Angora, by Campbell Thompson, and at Alagheuz in Russian Armenia by the late J. de Morgan; but that is all that we can say at present. Nor have we any more satisfactory information about the history of Asia Minor in Neolithic times. The few



CULTURE AREAS INTO WHICH THE MEDITERRANEAN IS DIVIDED

During the centuries through which the course of events in Egypt can be followed, there were Mediterranean communities whose cultural development can be synchronised with whatever Egyptian dating is adopted, though of their history in the restricted sense nothing is known. Yet they were not isolated, for the Minoan culture was much influenced from Egypt, the Cycladic from the East; the Helladic first from the Cyclades, then from Crete. More detailed maps appear in Chapter 26.

excavations that have been made there—those of Troy by Schliemann and his colleagues and successors, of Boghaz Keui by Winckler, of Carchemish by the officials of the British Museum—do not appear to have tapped any purely neolithic stratum.

At Sakje Geuzi in North Syria, excavated by Garstang, the two lowest layers are neolithic, but probably not of the earliest phases of the Neolithic Period.

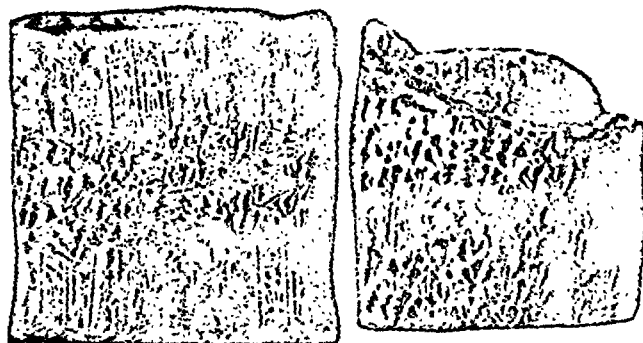
They yield implements in obsidian, bone objects, and sherds of black pottery with incised linear ornament. The later neolithic layer showed coloured pottery, adorned with straight or wavy lines, and patterns of dots, painted in black on a buff ground. But until a much greater number of sites is explored, it will be impossible to say where these wares fit into a historical scheme. The presence of obsidian in the earlier stratum is of importance, as suggesting that trade with Melos, chief source of obsidian for the Aegean basin, had already been established.

On the border-line between the Age of Stone and the Age of Metal a new culture spread gradually over the nearer East. The characteristic of this change is the supersession of the earlier black ware by ware of a red colour. This change is attributed, primarily, to an improvement in the firing of the pottery, resulting, presumably, from improvements in the potters' kilns. The earlier ware had been baked in an open, smoky fire. The surface of the vessels so treated had been stained black by the smoke; the stain, having been accepted by the potters as inevitable, was merely made uniform by artificial means. In the new kilns, the presence of iron oxide in the clay produced a red colour in the ware. This, in its turn, was made uniform by washes or otherwise, and was burnished.

In the basin of the Danube, in Turkistan to the east and in Syria to the south, this red ware corresponds in time with the first appearance of metal tools. No inscription,

however long it might be, and however full in historical details, could be so eloquent of the movements of peoples and of trade intercourse as these red potsherds, collected together from sites so far apart. They are judged to date approximately from 4000–5000 B.C.

The earliest centre of historic interest in the peninsula is the region which in classical times was called Cappadocia.



LETTERS FROM A CAPPADOCIAN FILE

Babylonian was one of the many influences that early converged towards the Inland Sea. As far west as Cappadocia Babylonian merchants settled; their 'files,' consisting of clay tablets sealed in clay envelopes, have been discovered with pottery of almost Minoan appearance. On the right a tablet may be seen projecting from its broken envelope.

Courtesy of Professor Hrozný of Prague

In or about the middle of the third millennium B.C. the Sumerian kings of Babylonia extended their empire to include Cappadocia; and a large number of clay tablets, bearing documents in the cuneiform script, have been found there. Although these tablets are in the Semitic Babylonian language, they present certain linguistic peculiarities, due to the contamination of some foreign tongue, presumably one of the dialects collectively known as 'Hittite.' Besides these linguistic peculiarities, there are revealed details of social life which likewise indicate non-Semitic associations.

Thus it is in Cappadocia that we first come upon the track of that mysterious people whose empire was destined to spread over practically the whole peninsula, and to interrupt for once its otherwise unbroken record as a seething cauldron of irreconcilable ethnical elements. Eastern and Western here meet, and here form inextricable mixtures. Asia Minor is at once, if we may be permitted the paradox,

a thoroughfare and a cul de sac. It is a road whereby Europe may enter Asia; it is a barrier which closes Europe to the westward march of the Asiatic. Here, on a non-European soil, and amid incongruous non-European surroundings, the Ionian Greeks eventually laid the foundations of European literature.

The history of Asia Minor, so far as we can reconstruct it, has almost always been the history of the squalid jealousies of small communities, turned by some dominant power in the background to its own advancement and aggrandisement. In the time of the Hittite Empire only there has been any pretence of unity.

We know the names, but little more, of communities which existed before the establishment of the Hittite Empire in Asia Minor. Strange words—*How the Hittites were rediscovered* Hanigalbat, Arzawa and so forth—flit across the pages in which scholars attempt to reconstruct their fragmentary history. Fifty years ago the name of the Hittites themselves was not much less obscure. It was, of course, familiar, but only as that of a small community in Palestine with which Abraham had dealings, and which was among the peoples whose territory was promised as a heritage to the Israelites, during their desert wanderings.

With the decipherment of Egyptian and Babylonian records it began to be clear that the Hittites must have been something more than this; at least, that there must have been a people of the same name, of which the Egyptian monarchs, for all their chauvinism, could not choose but speak with respect. But no tangible remains of this people were recognized until 1872. In that year Dr. William Wright, a missionary of the Irish Presbyterian Church in Damascus, made the suggestion that certain remarkable in-



THE HITTITE TYPE

Not themselves of Mediterranean type, the Hittites were an important Anatolian people who came to dominate much of the Asia Minor coastland. Their statues show them buskined, belted and wearing a high hat.

Berlin Museum

scriptions and sculptures, discovered from time to time in North Syria and Asia Minor, were of Hittite origin.

One of these inscriptions, at Hamath, had been seen, but very inaccurately described, by the French traveller La Roque as far back as 1722. Wright's suggestion was at first received with scepticism, if not with ridicule; but it was supported by the championship of Sayce, and in later years the excavation of Boghaz Keui has shown that it was one of those brilliant flashes of insight which foresee a truth before it can be

mathematically proved. The wealth of material that Boghaz Keui has yielded to its explorers includes a library of no fewer than 20,000 tablets. Among these have been discovered drafts of the famous treaty (see Chronicle II) that Rameses II of Egypt found himself obliged to conclude with the monarch of whom, in impotent spite, he speaks as 'the vile king of the Kheta.' Here, in the capital of the 'Kheta,' is the other side of the story. Here is a link connecting the Kheta, that is the Hittites, with the strange sculptures which had been identified as their handiwork some fifty years before.

From these inscriptions and sculptures we learn that there had been a notable civilization extended over almost the whole of Asia Minor; for the extent of its remains covers nearly its entire area, from the Mediterranean to the Euphrates, and even some little way across that river. Observe that we say a notable 'civilization,' not a nation or empire; for all the indications go to prove that the Hittite Empire was not a homogeneous whole, but a coalition of originally independent political units.

The sculptures reveal to us their kings and their gods, with heavy, rather stupid-looking Mongolian-like faces, adorned with huge beards, though these are not

always present. On the body is worn a close-fitting jerkin, without sleeves, secured with a broad belt. The feet are encased in buskins with upturned toes, as in a modern Turkish slipper.

If we pass over vague records of an expedition of Sargon I to Cappadocia, in or about 2725 B.C.; the evidence of the tablets already mentioned; and the story of a counter-expedition of 'Hatti' (or Khatti) against Babylon nearly a thousand years later than Sargon; the detailed history of the Hittite Empire begins with a king who bore the name, monstrous to our eyes, of Subbiluliuma. This personage, who began to reign in his capital Hattusas (or Khattushash—see note in Chap. 23), the modern Boghaz Keui, somewhere about 1400 B.C., might very fairly put in a claim to have been the Alexander the Great of his time and of his people. It was his power and energy that welded the communities of Asia Minor into an empire which for a time was able to resist the might of Egypt and of Babylon alike.

The interpretation of the vast collection of tablets from Boghaz Keui is still in progress. Some of them are in Babylonian, and these can be read with no

greater difficulty than any

Translation of other Babylonian tablets.

Hittite archives Others, however, are in the native tongues of

Hattusas and of its dependencies, and the interpretation of these is a very different matter; though it is, naturally, the chief centre of interest. Not one, but no fewer than six languages or dialects have been recognized by scholars who are working on the material, and some at least of these languages are claimed to be Indo-European in character, with a distinct affinity to Old Latin.

As though to verify this surprising conclusion, the text of a treaty found among the collection has revealed the still more surprising fact that gods with the familiar Aryan names of Indra, Varuna, Mitra and the Nashatyas were invoked by the people of Mitanni. This was a community living across the Euphrates, closely related to the people of Hattusas, and speaking a similar language, of which we had already known something from the Tell el-Amarna correspondence (see page 665).

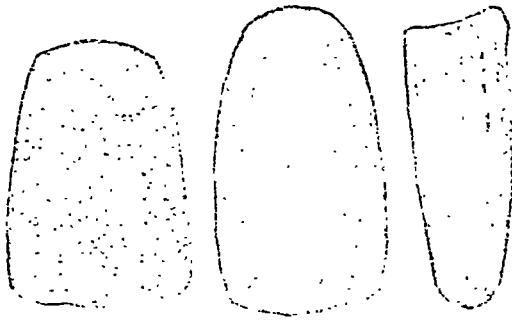
As time advanced, political circumstances transferred the chief seat of Hittite power from Hattusas to Carchemish on the Euphrates (see Chap. 26); and in the excavation of the latter site remains of Hittite civilization at a later stage were unearthed. There was a sufficient identity of type between the sculptures at the two sites to leave

Hittite hieroglyphs at Carchemish

no doubt that they belonged to the same culture; but at least one important change had taken place in the meanwhile. The use of the cuneiform script had been practically abandoned. Its place was taken by the peculiar picture-writing, the mystery of which first aroused interest in the Hittites.

At a careless glance, this script appears to resemble that of Egypt, and it may well be that Egypt supplied the inspiration that led to the evolution of a character less burdensome to the memory than Babylonian cuneiform. But when examined in detail, the two schemes of writing are seen to be entirely different. The contrast between Boghaz Keui and Carchemish in this respect is all but complete. The hieroglyphs are not absolutely unknown at Boghaz Keui, but everything important is in cuneiform; the cuneiform is nearly absent at Carchemish, which yielded a number of inscriptions, some of them of considerable length, in the hieroglyphs.

Until a bilingual inscription shall be found, giving the hieroglyphics along with an interpretation in some language that can be read, we cannot expect to go very far towards solving the problem of these later inscriptions. We cannot even assume that they are in any of the languages of the Boghaz Keui tablets, though no doubt this is the most probable hypothesis. As yet the only available bilingual is a small article, possibly a seal, of silver, now lost, which bore the figure of a man with his name and rank—'Tarriktimme, king of the land of the city,' as it has been deciphered—stated in cuneiform and (presumably) also in the half-dozen Hittite characters which the object bears in addition. This affords but a slender basis for interpretation; yet it must be admitted that the various attempts at decipherment, that have so short a document for their



CRAFT AND TRADE IN EARLY CRETE

Far back in Neolithic times Crete was inhabited by no mean craftsmen, as shown by the two polished stone axe-heads (left). The flake of obsidian proves that oversea trade had developed with Melos, source of that material in the Aegean.

British Museum

starting-point, are wonderfully ingenious, and often very persuasive, though they do not always carry instant conviction.

The Hittites, for all the heavy expression with which their sculptors credit them, were good soldiers and admirable metallurgists. They were sufficiently civilized to have a formal code of laws; and were artists whose rock sculptures, though apt to be clumsily massive in effect, yet show no small command of the elusive quality of 'life,' especially in the representation of animals. They belonged to the Anatolian rather than the Mediterranean race, if their portraits tell the truth; but, if not indigenous, whence and when did they come to the land of Cappadocia, where we first find them? That is one of the problems which the nineteenth century has bequeathed to the twentieth. It will be solved some day, when further exploration has been carried out.

Contemporary with this Asiatic power there were settlements of a different type, in the regions of Asia Minor bordering on the Mediterranean. Of these the best known is Troy; but as its remains are described in Chapter 29 we need say no more about it here, except this: that although Troy and its civilization had elements cognate with the civilizations of Crete and its dependencies, it is not identical with them; elements native to Asia Minor predominate, mixed with others from the Danube region.

There is a remarkable type of painted ware, of which the centre of distribution may have been Elam, but which is found

throughout Asia Minor, and as far south as Syria and Palestine (see page 457). It belongs (in Asia Minor) to the latter part of the Bronze Age. Its decoration was perhaps influenced by the art motives of the later Minoan periods; but even if we accept such accretions we are left with a residuum which Cretan art will not explain—an independent Asiatic growth.

Archaeologically, Crete is the centre of interest in the Eastern Mediterranean. As yet, no evidence of a palaeolithic occupation of the island has come to light; but in the Neolithic Period it must have been very populous; and the neolithic stage of Cretan culture, if we may judge from its great depth of accumulation, must have been of long duration. At Cnossus, for example, there was a neolithic stratum which at one place was no less than 26½ feet in thickness. If this great mass of debris had accumulated at the same rate as the later strata of the Bronze Age, the neolithic occupation of the site of Cnossus must have lasted about 5,000 years; and if we take 3500 B.C. as an approximate date for the end of the Neolithic Period, that would bring us back to something over 8000 B.C. as the date of its beginning.

Even this remote date does not mark the first appearance of human life on the island, for there are other neolithic sites—open-air villages, single habitations and cave dwellings—some of which belong to a yet more primitive stage of neolithic civilization than happens to be represented at Cnossus. We must go back still further—say about two centuries—to find a date for the earliest discovered remains.



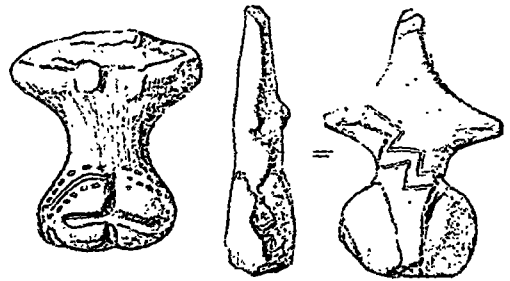
THE WEAVER'S IMPLEMENTS

Though no textiles have survived, discoveries of clay spools for winding thread (left) and of spindle-whorls (edge-on and from above) tell that spinning had been mastered by the neolithic Cretans. The spools bear incised decorations.

From Evans, 'Palace of Minos,' Macmillan

Although the neolithic folk of Crete possessed no metals, they were by no means primitive barbarians. They polished their stone tools, and they made pottery which, within its limitations, was aesthetically attractive as well as useful. It was decorated with incised lines forming geometrical figures; and these incisions were frequently filled with a paste of powdered chalk or of a red ochreous substance, so that the designs stand out boldly in white or in red against the background of the ware. Spools and spindle-whorls of clay show that they could spin and work in textiles; although naturally the perishable products of this industry have not survived. Chipped implements of obsidian testify to an oversea trade with the island of Melos.

Like several other neolithic peoples of southern Europe, those of Crete made idol figures of the divinities whom they worshipped, and these give us information regarding their skill in the plastic arts and their religion. So far as the former is concerned, we cannot say that the neolithic Cretans took a high place: but amorphous though their idols may be, they possess great value for us. They show us that the dove and the ox were already considered sacred, and that a female divinity was worshipped: presumably a goddess of fertility, who is represented with the lower limbs absent or absurdly shortened, perhaps to suggest the attitude of squatting. The figure as a whole assumes a shape resembling the



VIOLIN-SHAPED CRETAN IDOLS

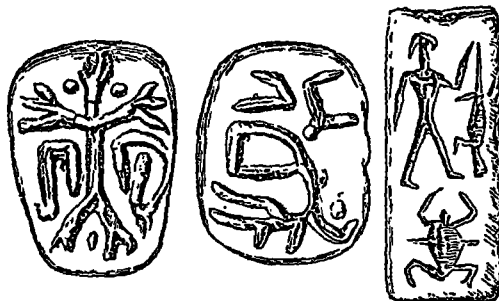
Two of the strange neolithic Cretan types of female idol are here shown: that on the right seems to indicate a sitting or crouching attitude, that on the left a very characteristic squatting position with feet drawn under the body.

From Evans, 'Palace of Minos,' Macmillan

body of a violin. Such figures are found around almost the whole Mediterranean basin; though simple in form they present a variety of types, and the study of their interrelation is somewhat complex.

The name 'Minoan' has been given to the phases of Bronze Age civilization which succeeded the neolithic in Crete. The great legendary tyrant and lawgiver Minos occupies the centre of the stage in the later traditions of Crete, as they are given to us by the writers of Classical Greece; the name is thus romantic, if rather inappropriate. During the Bronze Age the island had its vicissitudes. More than once were its cities and its palaces sacked, necessitating complete reconstruction. These turns of fortune are reflected in the varying phases which the history of the Minoan culture presents.

The history of the Minoan civilization is divided, for the sake of convenience, into three major periods, each subdivided symmetrically into three minor periods, making nine in all, as follow:



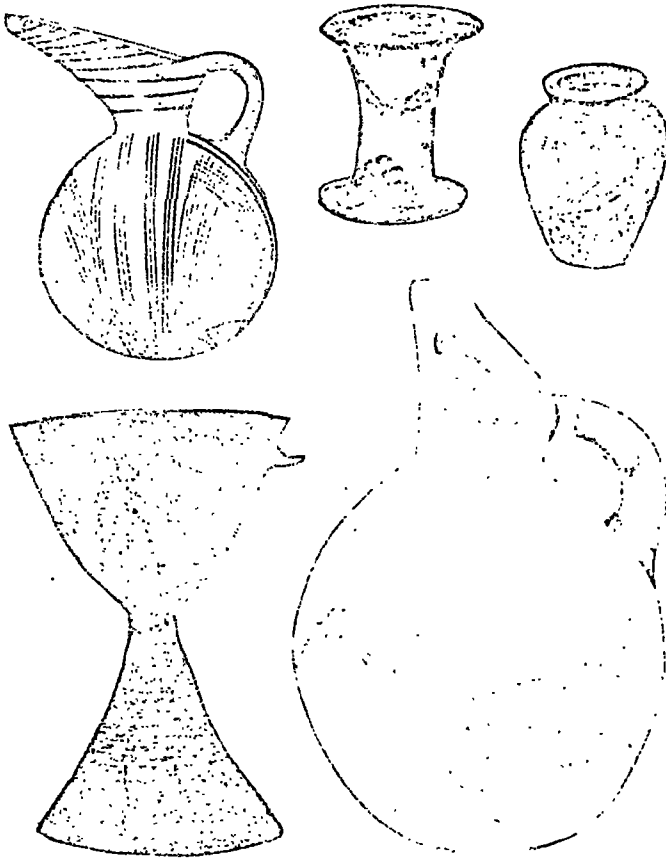
EARLY MINOANS USED SEALS

Seals appear in the very early days of the Minoan (as distinct from the neolithic) culture in Crete. Two faces of a prism-shaped seal (E.M. I) are shown on the left, while the similar Egyptian seal alongside, found at Karnak, equates its date with predynastic times.

From Evans, 'Palace of Minos,' Macmillan

EARLY MINOAN		I, II, III
abbreviated E.M. I ..	c. 3600-2800 B.C.	
" E.M. II ..	c. 2800-2400 B.C.	
" E.M. III ..	c. 2400-2100 B.C.	
MIDDLE MINOAN		I, II, III
abbreviated M.M. I ..	c. 2100-1900 B.C.	
" M.M. II ..	c. 1900-1750 B.C.	
" M.M. III ..	c. 1750-1600 B.C.	
LATE MINOAN		I, II, III
abbreviated L.M. I ..	c. 1600-1450 B.C.	
" L.M. II ..	c. 1450-1350 B.C.	
" L.M. III ..	c. 1350-1200 B.C.	

Approximate dates have been given to these periods by their association with Egyptian objects, according to the scheme of Egyptian chronology in use in this



FASHIONED WITHOUT THE POTTER'S WHEEL

This group of E.M. I pottery shows what splendid effects could be achieved without the potter's wheel. Simple linear decorations (top left) had by now appeared, and sometimes, as on the chalice (bottom left), these seem to imitate wood graining. Others, such as the beaked vessel, suggest metal originals.

From Evans, 'Palace of Minos,' Scager, 'Mochlos,' and Prof. F. Halbherr

work. From the first the Cretans maintained trade relations with Egypt; imports from each country are found in the other, accompanied with native products that teach us what styles and types were contemporary. We cannot yet read the inscriptions on the Cretan tablets; but those of Egypt can be deciphered, and from that country we can get some approximation to a fixed chronological scheme.

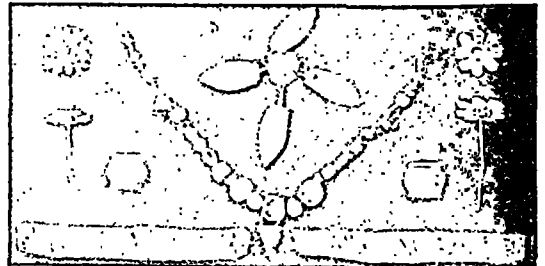
From these comparisons we learn the remarkable fact that throughout their history the two countries rose and fell together. Egypt passed through alternating phases of glory and eclipse. The great days of the Old Kingdom are succeeded by the confusion of the dynasties between the Sixth and the Eleventh, which are almost blank pages in the history of the

country. The Middle Kingdom follows with its grandeurs, only to be succeeded by the evil days of the Hyksos domination. After this there is a final blaze in the New Kingdom, and then the book of the greatness of Egypt is rolled up and sealed for ever with the signet of Ichabod. In Crete, the great days of the Early Minoan are contemporary with the pyramid builders of the Old Kingdom, and its latter end (E.M. III), which shows decided deterioration, with the obscure period which followed them. The Middle Minoan at its highest and the Middle Kingdom of Egypt exchange their wares: and the Late Minoan, in which the Cretan tradition gloriously perished, corresponds in time with the end of Egyptian greatness in the New Kingdom.

In the slender-limbed men of Crete, whose simple attire revealed the trim neatness of their bodies, we may see the Mediterranean race at its best. Though its population became increasingly mixed, the civilization of Crete was a creation of the native race

living on the shores of the sea that was set from of old in the midst of the world.

E.M. I in the beginning is little more than a development of the preceding neolithic culture: copper, however, has



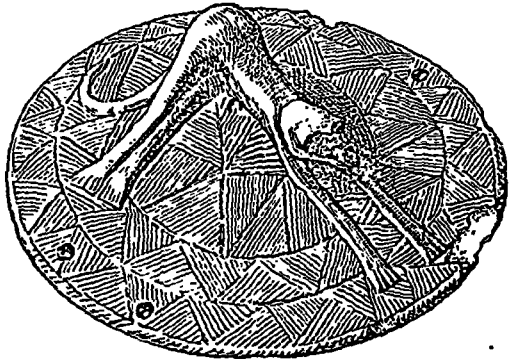
GOLD FLOWERS TO ADORN THE DEAD

Found in tombs at Mochlos of E.M. II date, these fragments of gold leaf delicately cut to the shape of flower petals speak of an enhanced artistic sense as compared with the work of the preceding period.

From Scager, 'Explorations in Mochlos'

come into use, though still in restricted quantities. The pottery is still hand-modelled, the potter's wheel not having yet been introduced. It is, however, better fired, and shows indications of an improvement in the potter's kiln. Two influences can be traced in the ornamentation of the vessels: the influence of wood and metal work. We may suppose (though naturally, owing to the decay of the material, we cannot prove) that wooden vessels were in use as well as vessels of pottery; they are freely employed in southern Europe and western Asia at the present day. Some of the pottery vessels belonging to E.M. I show in their decoration attempts to imitate the graining of wood; and in a finer ware, especially from the later stages of the period, we may perhaps see an attempt to imitate the smooth surface of vessels of metal.

Painted decoration, as well as incised lines, appears in the pottery of this period. The ornament of this form consists simply of groups of lines, parallel or crossing each other, in dark colours against the light background of the ware. Idols are found, similar to the Neolithic clay figures; but many of these are now made of stone, and the modelling, though still rude, is on the whole less degraded.



ANCESTOR OF MODERN CRETAN DOG

The naturalistic carving of animal forms had taken great strides in E.M. II, from which period dates this green steatite lid with a dog for handle, found at Mochlos. The dog is of a breed still common in Crete.

From Seager, Explorations in Mochlos

Already the Cretans had begun to use seals of steatite, engraved with various figures, in which may be seen the germ that was afterwards to develop into a system of writing. The figures represent various living forms—men, quadrupeds, scorpions, insects, etc.—as well as fantastic devices to which it would be difficult to attach a name. There are elements in the decoration and form of these seals which link them with similar products in Egypt and in Mesopotamia: so that already in the fourth millennium B.C. trade relations with these centres of civilization had been established. The importation from Egypt of vessels in ornamental polished stone is another indication of this. Inter-course between nation and nation is therefore having its effect even at so early a date in introducing complexities into the history of civilization.

E.M. II shows us the Minoans well embarked on their great career. In every department of human life that can be illustrated by excavation there is evidence of a marked advance. Pottery is much more shapely than before, and it shows a vastly increased variety of form and



TWO PROBLEMS SET BY MINOAN POTTERY

In the pottery of E.M. II, besides its greater variety of shape and painted decoration, we notice the prevalence of a peculiar mottled colouring, as in the left vase, produced—just how, we do not know—by skillful variations in the firing. The purpose of the double-spouted jugs (below) is also a mystery.

From Boyd Hawes, 'Gournia' and Seager, 'Mochlos'



POTTER'S PROGRESS IN A DEGENERATE AGE

A degeneration from the earlier periods in many respects, E.M. III yet shows one striking innovation in the decoration of pottery. Instead of dark lines being painted on a naturally lighter background, the whole background was now given a dark wash, with lighter lines, often spirals, painted thereon.

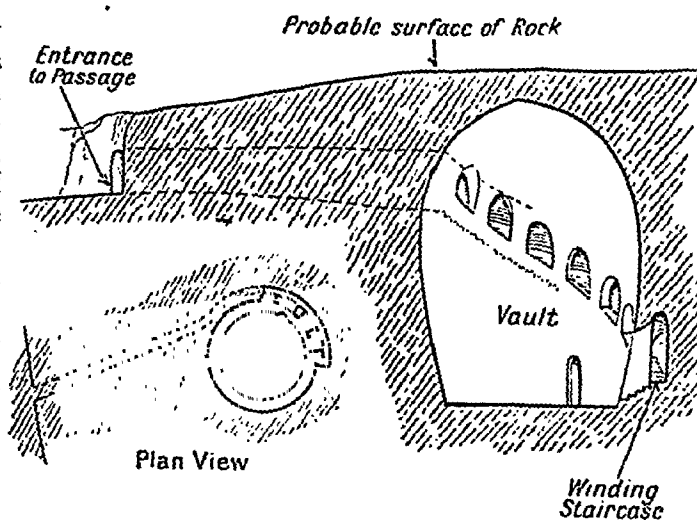
Candia and British Museums

an elaboration of painted ornament. As in E.M. I, this consists of combinations of dark lines over a light background. In addition to this more ordinary form of ornament, a new decorative device makes its appearance. It consists in skilfully diversifying the intensity of the firing of the vessel, thus producing a play of different colours in the surface of the ware itself. Sometimes a regular pattern is obtained by this treatment; but more commonly the effect depends simply on the interpenetrating masses of contrasted shades of colour.

There is close correspondence with the contemporary culture of Egypt, trade with which land is probably indicated by the presence of objects in ivory. Small idols are found in Cretan tombs very similar to figures from Egypt. Spouted

vessels are found in both countries, and, strange to say, in both countries there appears a freakish duplication of the spout. It has been sought ingeniously to explain this practically useless, and seemingly inconvenient, device as being intended for pouring out libations in honour of two deities at once, so as not to run the risk of giving even a momentary preference to one of them over his possibly jealous partner. It may be so: but a bronze vessel like a coffee-pot with two spouts was found some years ago in a medieval lake-dwelling in Ireland, where the jealousies of Set and Horus would surely be regarded with indifference!

The aesthetic sense of the Minoans of E.M. II was incomparably higher than that of their predecessors in E.M. I. The plastered surfaces of house-walls were washed over with red paint—not a great thing in itself, but the beginning of an artistic movement which culminated in the wonderful frescoes of the palace



EVIDENCE FOR AN EARLY MINOAN PALACE?

Beneath the palace foundations of later periods at Cnossus was found a circular underground chamber approached by a spiral staircase, here conjecturally restored. Its date is E.M. III, and it perhaps indicates that a large building stood there earlier than any palace of which we know.

From Evans, 'Palace of Minos,' Macmillan



FOREIGN TRACES IN MINOAN SEALS

Seals are a redeeming feature of E.M. III (top); for the labyrinth pattern, see text. In M.M. I they are better still; in the betrothal scene on the right Babylonian influence is obvious, whereas the figure on the scarab is imitated from the Egyptian hippopotamus goddess, Taurt.

From Evans, 'Palace of Minos,' Macmillan

chambers. Charming ornaments in gold leaf, cut into the shape of leaves and flowers, are found in the tombs of the period. The seals of this age cannot be said to have advanced much further toward perfection; but on the other hand there have been discovered some remarkable realistic figures of animals, carved in the round from soft stone.

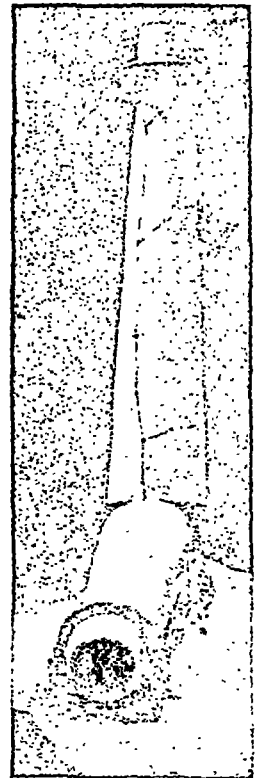
In E.M. II the Early Minoan period reached its climax; for the evidence shows that E.M. III was a time of retrogression; and as we have already noted, it was contemporary with a similar retrogression in Egypt. E.M. II had shared the world, as then known, with the great pyramid-building kings of the Fourth Dynasty. The people of E.M. III saw the turmoil which Egypt suffered, and which broke up the civilization of the Old Kingdom, during the Sixth and following dynasties; and it may well be that, if we knew the details of Cretan political history during this time, we should see in the degeneration of Cretan art a reflex of the same causes as led to the Egyptian decline.

But while the traditions of E.M. II were gradually fading during E.M. III, the later period still contained within it the seeds of the grandeur of the Middle Minoan. A very remarkable rock-cut chamber, found underneath the palace

of Knossos, may possibly indicate that already some important structure had been built on the site, although the history of the palace as we know it begins later.

The pottery decoration now completely changes its character. In the two preceding periods it had chiefly consisted of dark lines painted over a light background. Now we find the background painted over with a dark wash, and the designs in light-coloured lines contrasting with it. Among these designs, the spiral, which is destined to be an important element in Cretan decoration, makes its appearance on the island for the first time.

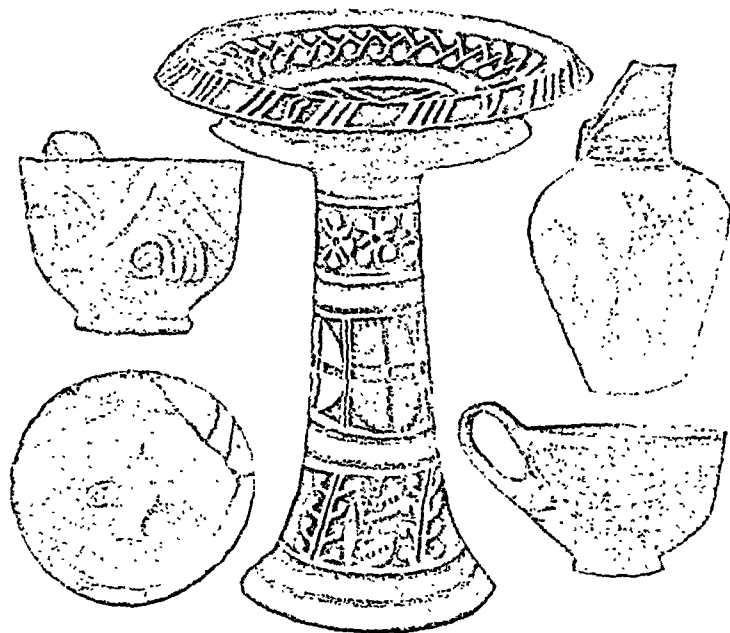
The seals are now engraved with a surer touch, and some striking symmetrical patterns are evolved, including several which show a labyrinthine pattern. This is important, in view of the traditions associating Crete with the labyrinth of Minos and the Minotaur, and of modern theories connecting the labyrinth of folk-lore with the palace of fact. It has been too lightly assumed that the late legends are merely reminiscent of the palace. But while the labyrinthine palace of Knossos might have served as a concrete realization of the labyrinth of ancient tradition, that vast and complicated structure cannot be the actual origin of the labyrinth conception; for when the seals were cut it was not as yet in existence. The architects of Knossos may have built the palace to the specification of the labyrinth idea, but the labyrinth idea must have preceded the Palace of Knossos.



MINOAN WATER MAIN

In M.M. I the great palaces were begun; from that at Knossos comes this water pipe, adapted to prevent choking with sediment.

From Evans, 'Palace of Minos,' Macmillan



FIRST TYPES OF MIDDLE MINOAN POTTERY

With Middle Minoan opens the great period of Cretan culture. In M.M. I many new decorative motives appear on the pottery, some of them (such as the butterfly on the jug, top right) foreshadowing the naturalistic developments of later days. Moulded decorations are also applied, as in the bowl with a dove at the bottom.

Candia Museum (photos, G. Maraghianni) and British Museum

M.M. I at once surpasses all the achievements of the Early Minoan periods. The great palaces begin to take their shape. A system of writing is developed. Art makes giant strides. The comforts and luxuries of life are cultivated to an extent unparalleled in any other ancient civilization. The Palace of Cnossus, for example, was supplied with water conveyed in pipes which were better adapted, as Sir Arthur Evans claims, for preventing the accumulation of sediment than the water-pipes of modern cities.

The pottery shows an extraordinary range of shape and decoration. Polychrome colouring now first appears, and the designs include zigzags, spirals and other geometrical figures, as well as attempts at realistic figures of beasts, birds and fishes—not, perhaps, uniformly successful, but often extremely good. Moulded decoration is also applied at this time to the surface of the ware.

The seals are of especial interest. They often depict scenes of human life—acts of worship or the like—and they permit us to see the Minoan men in their simple loin-cloths, and the women in their heavy,

many-flounced dresses. Religion, also, begins to take new forms, if we may judge from the assiduous cult of certain sanctuaries, caves and other places of pilgrimage, traditionally associated with this god or that. Devotees leave votive gifts behind, which the inquisitive archaeologist has carefully garnered with great profit to science. With the re-awakening of a feeling for art and culture, and a realization of the complexity of life, there must have arisen a desire after the unseen more intense than ever before. The old rudimentary cults of simpler days now failed to satisfy; men sought rest for their troubled spirits in toilsome pilgrimages,

and in devoting precious gifts to their gods. This must be the motive that we can trace behind the cult of the cave sanctuaries at the beginning of the great days of Cnossus.

M.M. II develops and extends the contributions to civilization and art made by its predecessor. The great palaces, begun in the earlier period, are completed. They consist of vast complexities of rooms, as a rule long and narrow, opening out of truly labyrinthine corridors and lying around a great central court. Staircases lead down to underground cellars, and up to a second storey. It is not too much to say that comfort and luxury were studied with a greater completeness than ever before in the history of the world. Thus the palaces had a system of sanitation superior to that of any other ancient civilization; superior, indeed, to that of any medieval European city. There was a royal reception hall; there was a private theatre, where the inmates of the palace were entertained with bull fights in which, as wall paintings show, girls as well as youths shared the dangers (see page 9). Though the palaces met with violent ends,

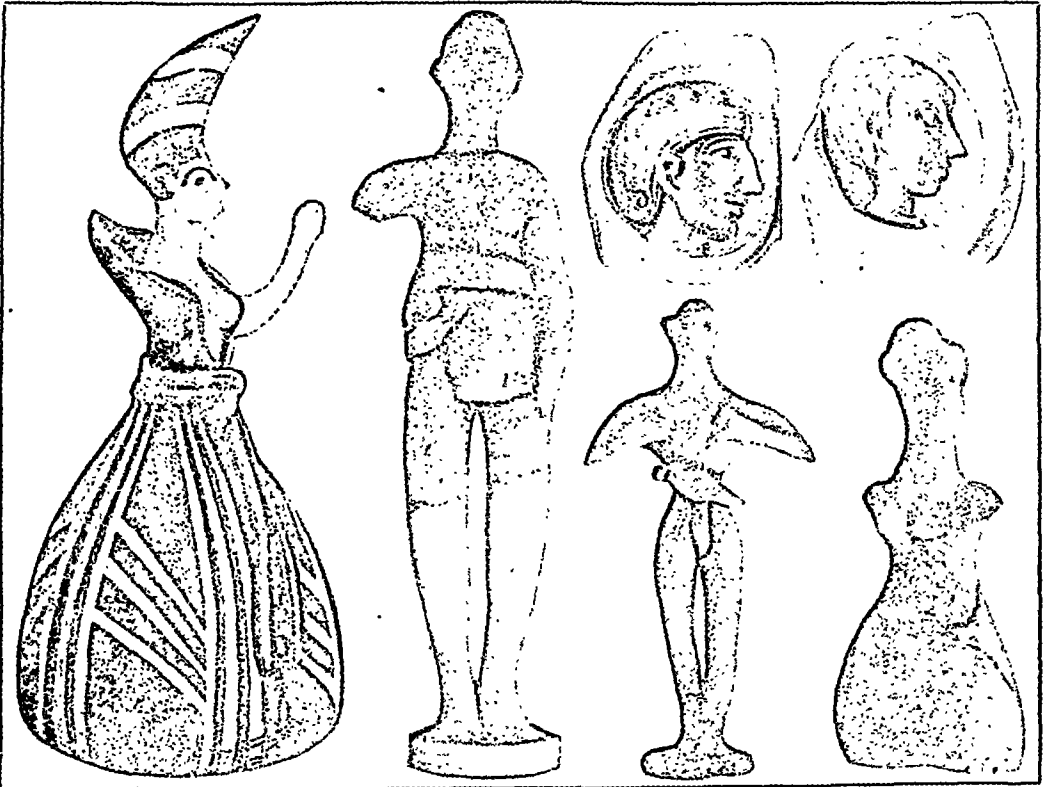
which involved their looting by foreign ravagers, a sufficiency of relics was left for the archaeologist to deduce the luxurious life of the occupants.

Huge jars stood in the store-chambers, with provision for the great household which the maintenance of the palace must have required. In appropriate receptacles were stored the carefully compiled inventories and stewards' dockets of the household goods. We cannot as yet read these ; but we may infer their nature from the frequent appearance of numerical signs. These documents assuredly contain much of value about the life of the palace, and we shall share in their secrets as soon as we can decipher them.

The pottery of M.M. II is marvellous. It is of almost every possible shape, and we find almost every possible variety of ware and of ornament. Some, smooth and hard as an egg-shell, is undoubtedly an

imitation of metallic forms. The painted decoration, especially in the variety named after the cave of Kamáres (where it was first discovered) defies description, so elaborate is its mosaic of colours and of forms, partly geometrical and partly floral. Among the geometrical figures the spiral holds a prominent place.

One of the most interesting discoveries belonging to this period, made at Knossos, was the relics of a tiled floor which had contained, among other things, a view of a town with its fortifications and its houses. This picture shows us, not the palaces, but the dwellings of the ordinary citizens who lived under the sway of the lords of the palaces. The houses themselves have long been razed to the foundations which an excavator lays bare ; so that had it not been for this floor design we should not have known that they rose to two and even sometimes to three storeys



CRETANS AS THEY SAW THEMSELVES IN MIDDLE MINOAN DAYS

In M.M.I and II we begin to get authentic glimpses of the Cretan himself, his life and outward appearance, largely through the improved technique of the seals and the custom of leaving votive offerings in sacred places. The seal impressions on clay from Knossos (top right) one can only regard as portraits, so sharply characterised are they ; while the terra-cottas from a sanctuary on the peak of Petsofá show men naked save for girdle and dagger, and women in elaborate dress.

From Candia Museum (photo, G. Maraghianni) and Evans, 'Palace of Minos,' Macmillan

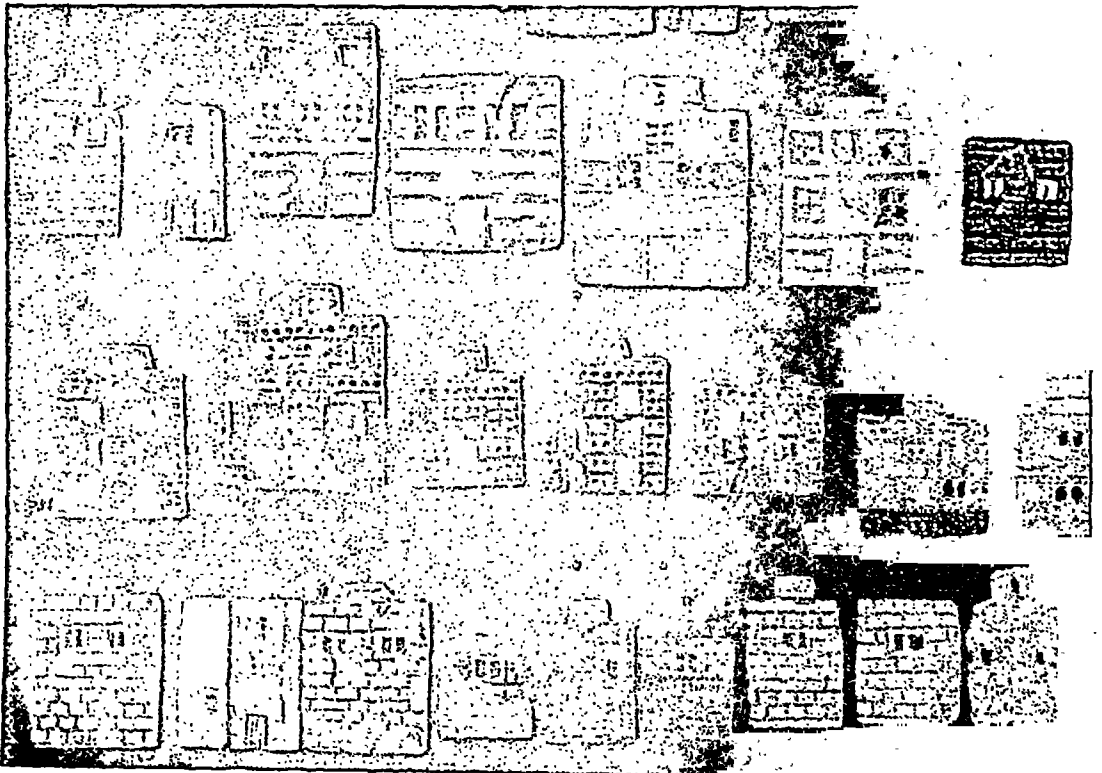
in height, with window-openings in each storey and sometimes with small 'prophet's chamber' roof attics in addition; that, in fact, if by some time-machine we could visit a Minoan town in the days of its glory, we should find it presenting an appearance not very unlike that of a modern European city.

The fronts of the houses are decorated with horizontal stripes, reminding us of the 'zebra' style of decorative building that was affected by some nineteenth-century architects; though probably the stripes are intended to indicate some form of framed timber construction. The bottom storey has no opening but the house door, in the centre of the wall. Its rooms, as a rule, were not lighted by windows opening on to the street, doubtless to avoid the gaze of the inquisitive, or the operations of burglars. Above, there are two or three windows, lighting the second storey; if there be a third storey, there are corresponding windows

above these. These windows are rectangular, and are subdivided into four or six small squares, indicating that they were fitted with frames containing either lattices or some sort of window-paning.

In the transition from this period to M.M. III, we find, once more, a remarkable synchronism between misfortunes in Egypt and misfortunes in Crete. The invasion of the Hyksos in the former country brought to a close its brilliant civilization. About the same time the palaces of Crete were reduced to ruins, and for a while were desolate. But this catastrophe, whatever its history may have been, did not involve a breach in the continuity of civilization. M.M. III is not a fresh civilization, built anew on the ruins of M.M. II: there are changes in detail, but on the whole the ancient traditions are maintained unbroken.

Cnossus was rebuilt with, if anything, greater complexity and magnificence than before. The grand main staircase, which



SOLID COMFORT OF THE HOUSES IN A MIDDLE MINOAN TOWN

The most impressive discovery of Middle Minoan times was the scattered pieces forming the inlay of a mosaic pavement (M.M. II). It originally represented a Cretan town by the sea, and from the study of the remains the amazing facts emerge that even as early as the eighteenth century B.C. ordinary Cretan citizens possessed large houses of timbered masonry; and that these attained a height of two or even three storeys, sometimes with an attic on the roof above:

From Sir Arthur Evans, 'Palace of Minos,' Macmillan & Co., Ltd.



OIL VATS WHOSE CONTENTS LENT FURY TO A PALACE CONFLAGRATION

Middle Minoan was the great period of the palaces, though for sheer worldly magnificence these culminated in Late Minoan times; in M.M. I they had been started, and in M.M. II and III took final shape. Knossos, chief centre of Cretan culture, had the finest, containing the vast magazines of which this photograph shows a part. The square cists were sometimes used for the storage of treasure, often, like the pottery jars, as oil vats; this is proved by their deeply carbonised surface.

Photo, G. Maraghianni

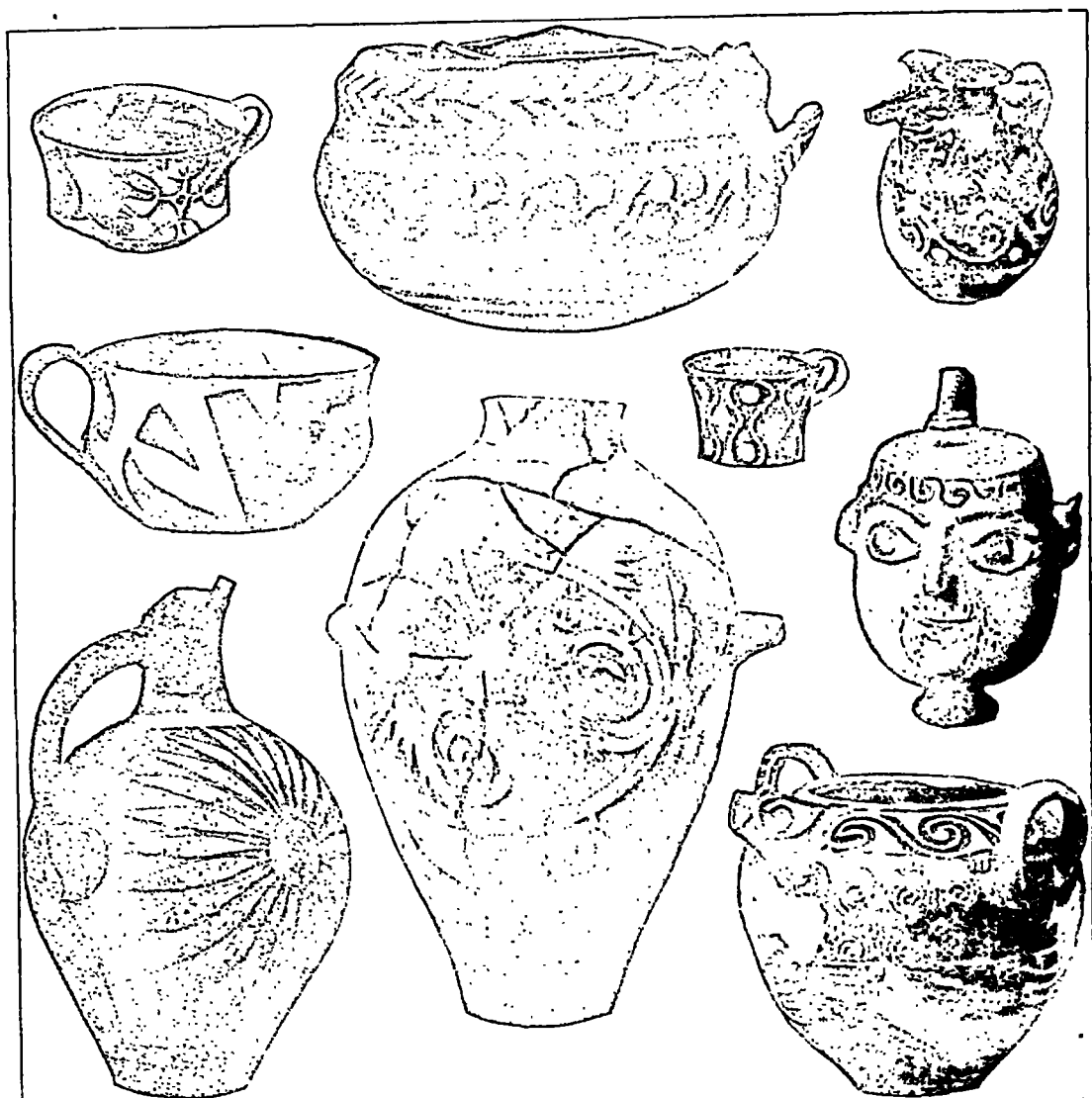
is among its most striking architectural features, and some of the most famous of the wall paintings are to be assigned to this period. The great royal draught-board, the finest portable work of art which Knossos yielded, is also referred to this period by Sir Arthur Evans, although some of the objects with which it happened accidentally to be associated, in the spoiler's 'dump' where it was found, belonged to L.M.I.

Once again we may trace further experiments in the field of religion. The favourite deity is now an unpleasant being whom explorers have labelled 'The Snake Goddess,' to serve until the decipherment of the tablets shall reveal her real name. She is represented in the Minoan many-flounced dress, cut low so as to expose the breasts, with snakes twining round her arms, waist and head-dress, or wriggling in the grasp of her hand.

Sacred symbols are much in use in this period, especially the cross and the

double axe. The coincidental use of the cross as a symbol in pre-Christian times is a well established fact, though it is not a matter to which much importance need be attached. But it is certainly startling to enter a chamber which appears to have been a sanctuary of this snake goddess, and to find a large cross as its central symbol.

Pottery shows a decline in technical excellence. Whatever the catastrophe may have been which submerged Knossos at the end of M.M. II, it seems to have involved the potters and their traditions in ruin. The artists of the new period turned their attention to the making of faïence, while their masters apparently preferred vessels in metal or in polished stone. Still, the pottery of the period shows some interesting and curious developments. In the first place, the polychrome decoration has for the greater part disappeared. There are a few survivals, but these merely serve to point the contrast. Secondly, there is a marked



POTTERY UNEXCELLED IN ANY LAND FOR TASTE AND CRAFTSMANSHIP

The crowning successes of Minoan pottery were achieved in the period M.M. II. The ware is uniformly superb—fine, hard and even, sometimes almost of egg-shell thinness and texture. Smooth metal originals are often imitated, but what a photograph best displays is the painted decoration, especially on the exquisite Kamáres ware like the large jar in the centre. The patterns are geometrical, the spiral predominating, but lightened and diversified by floral motives.

Candia Museum (photos, G. Maraghianni) and British Museum

growth in naturalism in presentation, as opposed to the artistic conventionalism of the earlier decoration. We must regard it as an indication of a decline in taste that pottery vessels are sometimes painted—with no small skill—to imitate the veining of polished marble. There are also realistic paintings of flowers, especially lilies; and life-like representations of flying-fish, octopi, dolphins and other marine creatures. It is strange that the artists sought no inspiration from the human figure, or from terrestrial beasts and birds. With some reason it

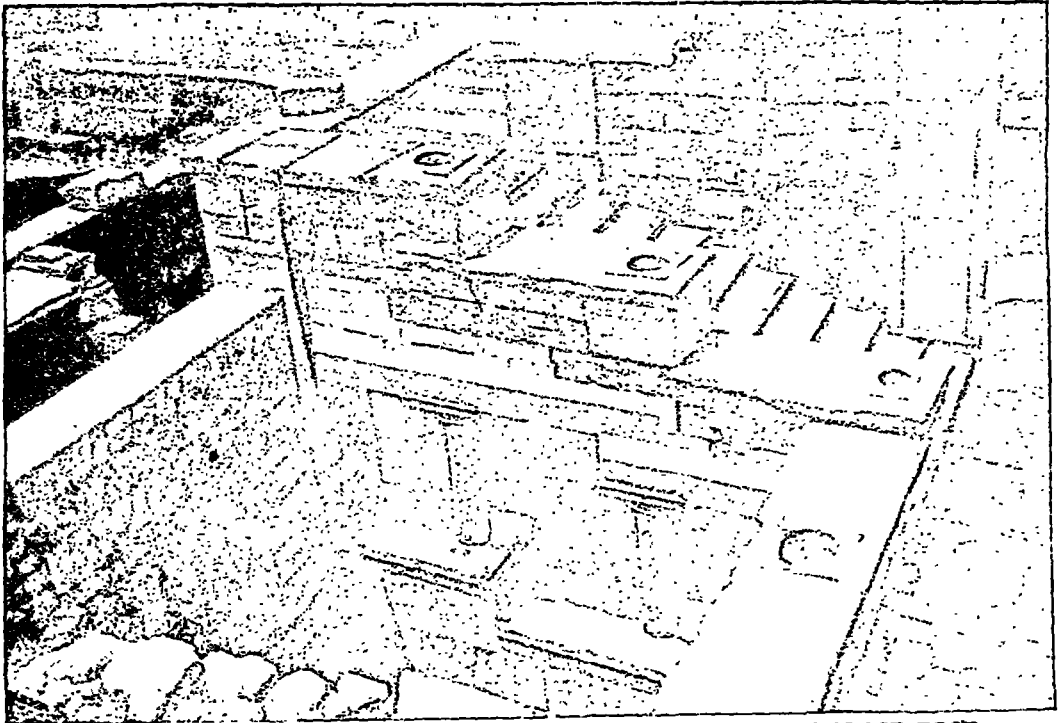
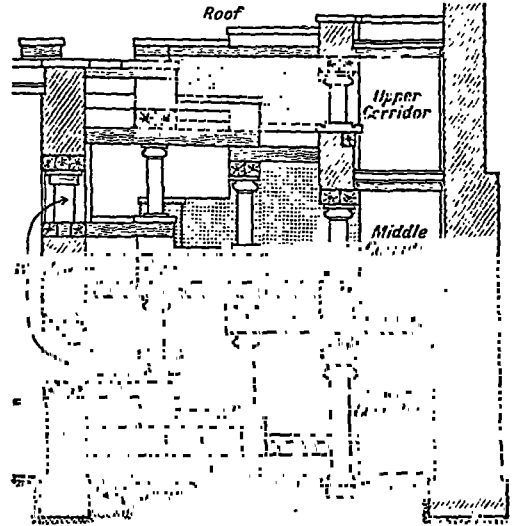
has been suggested that there may have been a religious taboo which forbade the free use of such subjects.

Writing was freely used; we may judge this from the scribbles found upon house walls even more than from the formally kept inventories and archives, of which we have already spoken. The latter are from the hands of professional scribes; it is their business not only to write, but also to read what is written to the magnificent, but illiterate, princes and nobles whom they serve. But wall scribbles are the work of the man in the

street, and so far as they are meant to be read at all they are meant for the perusal of the other man in the street; the existence of wall scribbles on an ancient site is, therefore, the most indisputable evidence possible of a general diffusion of the art of writing.

To this period belongs the famous Phaestus Disk, which was found in the palace of Phaestus. It is a flat, circular tablet of terra-cotta, six inches in diameter, with a spiral band roughly traced on each face. Upon this band there is impressed an inscription in some form of picture writing, of which no other example is known, in Crete or elsewhere. It would occupy space with little profit to tell here of the attempts that have been made to force a meaning out of this mysterious and fascinating document; only some happy discovery of a bilingual inscription will enable us to do that. But we must not fail to notice the way in which the inscription is written.

Forty-five different characters are used; and these have been impressed upon the clay, not with a clerk's stylus (like the characters of a cuneiform inscription), but with stamps or seals, which must have had some general resemblance to the sets



STAIRWAY ON WHICH THE PRIEST-KINGS OF THE CNOSSIAN PALACE TROD

Built as it was on the pent of a hill, it was not so difficult for the Cnossian palace architect to give his structure several storeys, approached by noble flights of stairs. There is evidence that such stairways were a feature of an earlier palace on the site (M.M. II), but it is from the remains of the M.M. III palace that the structure in this photograph has been rebuilt, enabling the architectural elevation above to be drawn (simplified after Christian Doll), restoring the upper flights.

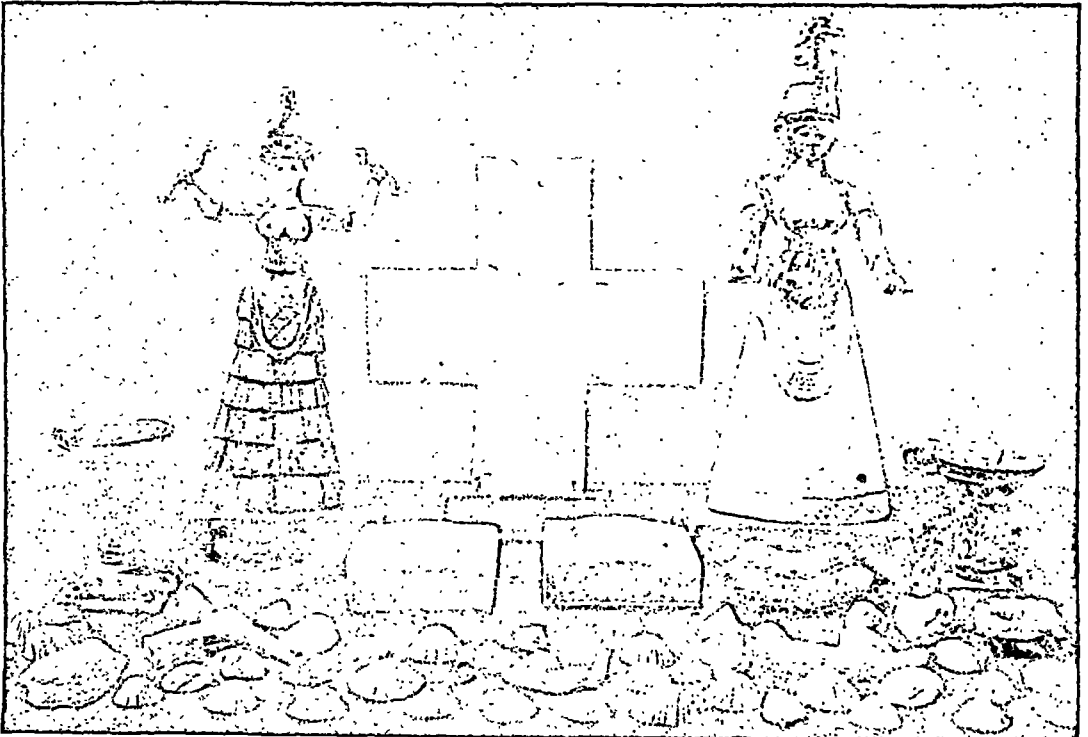
From Sir Arthur Evans, 'Palace of Minos,' Macmillan & Co., Ltd.



of stamps with which book-binders print titles upon the backs of books. The Phaestus Disk may fairly be described as the oldest example of printing from movable types in the world.

The Late Minoan periods which ensue fall outside the scope of the present chapter. They are a continuation of the previous periods, but at the same time there is some subtle change that seems to involve Crete in closer relations with the outside world ; to this time we may refer the legendary sea power of King Minos. Culture in a sense, as exemplified in the purity of art-forms, deteriorates ; but the burst of worldly magnificence enables a closer picture to be drawn of life on its social and material side, and for this the reader is referred to Chapter 25.

We therefore now leave Crete, carrying with us the chronological scale for which we went thither. We first proceed northwards to consider the islands of the Cyclades. These islands lie like stepping-stones



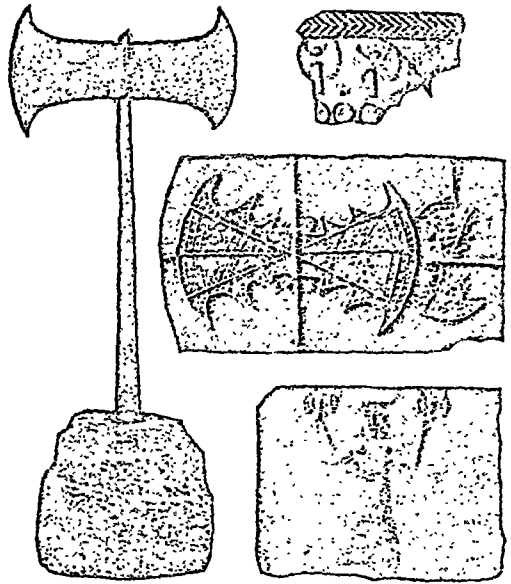
AS THEY PROBABLY STOOD IN A PALACE SHRINE : SNAKE GODDESS AND OFFERINGS

What seems to have been a repository of the M.M. III palace shrine at Cnossus contained these remarkable objects, placed as above in an attempt to suggest their original grouping. The cross used so early as a religious symbol is interesting, and probably of stellar significance ; the snake-entwined faience figures (known as ' Snake Goddess and Votary ') are perhaps both underworld forms of the great Mother Goddess represented in the upper statuette (see also plate facing p. 608).

Upper photo, Fitzwilliam Museum by special permission ; lower, G. Maraghianni

scattered over the Aegean Sea. But this was not their only importance in antiquity. They themselves early became centres of trade, in commodities which they yielded in abundance. Paros and Naxos supplied marble; but, still more important, Melos supplied obsidian. Man before the discovery of metals needed a stone which he could chip into knives, daggers and other tools and weapons. Flint was most suitable for this purpose; when flint was not to be had, some other substance had to be found or imported. Of the available substitutes for flint, obsidian, a closely allied material, was the best; and it was found abundantly in Melos, and nowhere else in the Aegean Sea. Trade with Melos must therefore have developed in Neolithic times, as we have already seen in speaking of Asia Minor and Crete, although there is actually as yet no known neolithic site upon the island.

The remains which excavation has yielded in these islands are closely analogous to those of Crete, and they follow similar lines of development; indeed, the intercourse between Crete and the Cyclades must, of necessity, have been intimate and constant. Parallel with the Early, Middle and Late Minoan Periods are the Early, Middle and Late Cycladic.



SYMBOL OF A CRETAN CULT

Most prominent of all Minoan religious objects was the great double axe of bronze. One was found set up in a stone socket in the Psychro cave; the seal impression shows the ritual use of these symbols, while above it is a stone mould for casting a large and a small one together.

From Ephemeris Archaeologike, Athens

But while following lines parallel with those of the Cretan arts, those of the Cyclades are not identical with them. They are, on the whole, of inferior merit,



THE TWO SIDES OF THE FAMOUS BUT ENIGMATIC PHAESTUS DISK

Fascinating problems are presented by a clay disk discovered at Phaestus in a M.M. III context. It is covered on both sides with signs running in spiral bands from periphery to centre, not engraved, but impressed with separate dies, one for each different sign—the first invention of movable type. Strangely, these signs do not belong to the Minoan scripts, hieroglyphic or linear; some authorities consider that we should look to Lycia on the opposite coast of Asia Minor as their place of origin.

Photo, G. Maraghianni



GARBED FOR MINOAN RITUAL

Varieties of costume, male and female, during the M.M. III are shown by hoards of seals found at Cnossus, Zakro and Hagia Triada. From their archaic character it is to be assumed that they are mainly garments worn on ritual occasions.

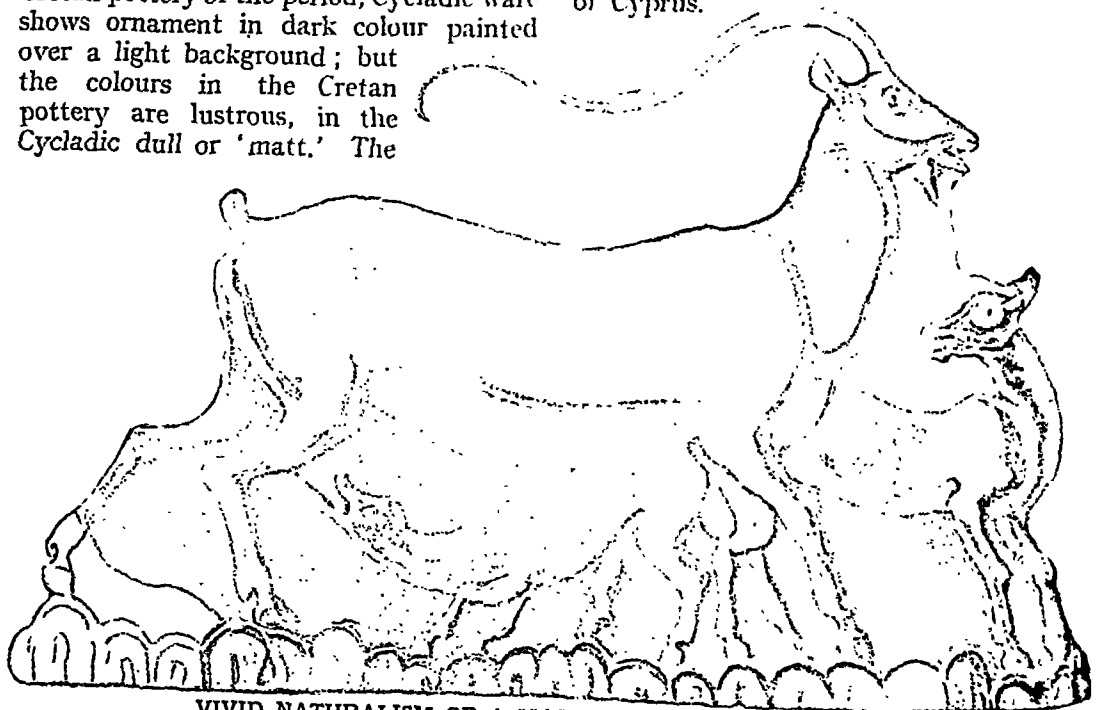
From Evans, 'Palace of Minos,' Macmillan

and altogether more primitive. In the Early Cycladic there is some evidence of Egyptian influence which, however, is insufficient to leaven its style. Like the Cretan pottery of the period, Cycladic ware shows ornament in dark colour painted over a light background; but the colours in the Cretan pottery are lustrous, in the Cycladic dull or 'matt.' The

result looks suspiciously like an unsuccessful attempt to imitate a form of decoration the technical processes of which were jealously kept as a trade secret in the larger island. Of Cycladic vessels, the most characteristic form is an ellipsoidal jug with a neck rising from one end—the shape has been compared to the body and neck of a duck.

Middle Cycladic is likewise more generally primitive in its attainments than the corresponding Middle Minoan, and in other respects it displays notable contrasts. Thus, the human figure is avoided by the Cretan artists in pottery decoration; it is freely used by the Cycladic artists. The peculiar mainland ware called Minyan was freely imported to the Cyclades, but has not been found in Crete—a fact not easy to explain. The Late Cycladic, like the Late Minoan, lies outside the date limits of the present chapter.

Despite these differences of detail, the Cycladic culture is closely cognate with that of Crete. Rather more remote from the Cretan standard is the civilization of Cyprus.



VIVID NATURALISM OF A MASTER WORKER IN FAIENCE

A fashion for faience seems to have been one of the reasons that led to a decline in the austere beauties native to pottery during M.M. III; but some of the faience panels, though florid, are certainly masterpieces. This specimen, from Cnossus, is of a Cretan wild goat with her two kids, one of which she is suckling; the artist has shown the acutest observation. Found in connexion with the palace shrine, it probably reflects the cult of the Mother Goddess, 'Mistress of Wild Beasts.'

From Annual of British School at Athens



These are the actual colours of the two faience figures reproduced in page 606. It should be noted that part of the skirt of the 'Votaress' (left), the neck and the body from the hips down of the Snake Goddess, and in both cases the left fore-arm are restored; but the restorations are well attested.



The only surviving fragment of wall fresco from the Early Cnossian Palace (Middle Minoan II) is known as the 'Boy Gathering Saffron.' He is placing the plucked saffron flowers in pots of M.M. II style. To judge from the hieroglyphic seals, saffron growing was one of the staple industries of Crete; but the plant was also connected with the worship of the mother goddess, so that this is probably a religious scene. The extant and restored parts are distinguished by different colour.

TRIUMPHS IN FRESCO AND FAIENCE OF THE MIDDLE MINOAN PERIOD IN CRETE

From British Museum and Sir Arthur Evans, 'Palace of Minos,' Macmillan & Co., Ltd.



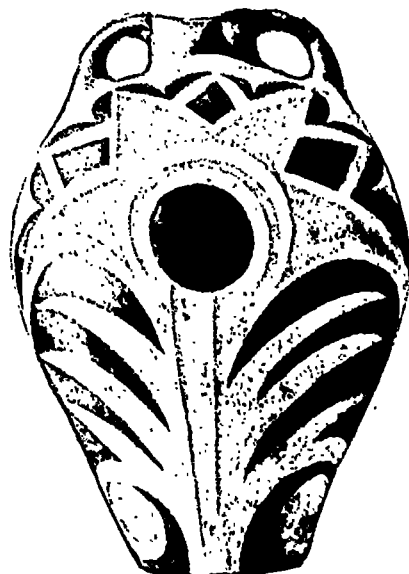
Pitcher with double-axe design
from M.M. I house at Cnossus



Two-handed pot
from Mochlos (M.M. I)



Conventional rock design
on cup from Palaikastro



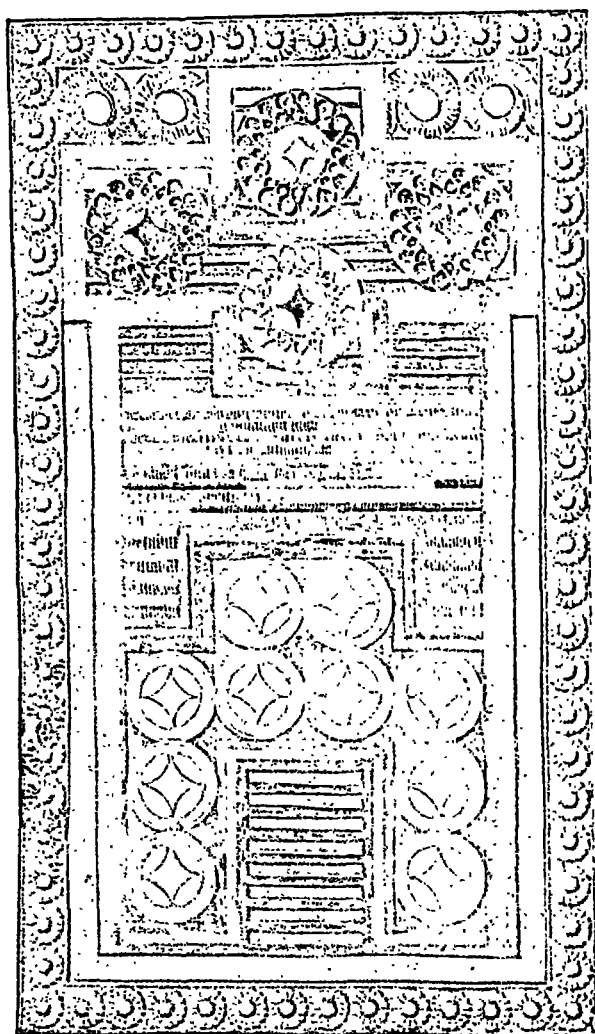
Like cup on left, a survival of poly-
chromy into M. III (from Cnossus)



Notable for its beautiful metallic
lustre : M.M. II pot from Cnossus



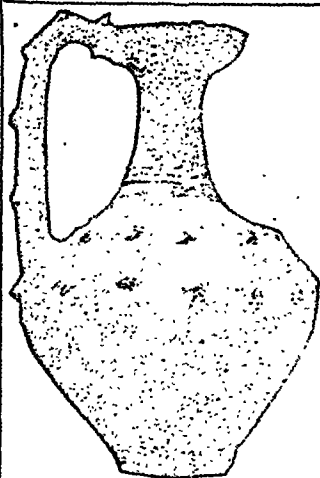
Finest specimen of the exquisite
M.M. II polychrome ware (Cnossus)



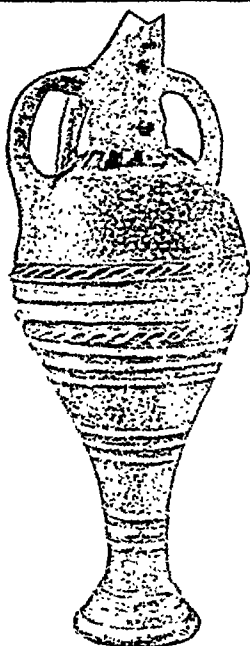
In many ways the Middle Minoan period represents the height of Cretan achievement. As the pottery here reproduced shows, the finest ceramics are the M.M. II varieties. The magnificent royal draught-board belongs to the close of M.M. III, but may have lasted as an heirloom into Late Minoan times. It measures roughly 38 by 22 inches, and is composed of gold, silver, rock crystal and blue paste in a framework of ivory, much of which had once been covered with gold foil.

EVIDENCE FOR THE EXQUISITE TASTE OF MIDDLE MINOAN CRAFTSMEN

From Journal of Hellenic Studies, Seager, 'Mochlos,' and Evans, 'Palace of Minos,' Macmillan



Plain-handled vase with bosses



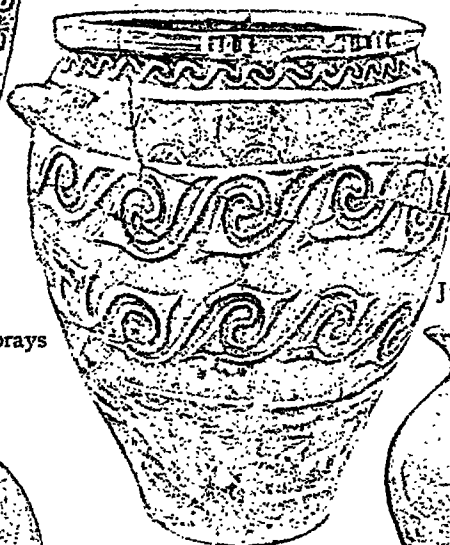
White-dotted vase with three handles



Jar painted to simulate conglomerate.



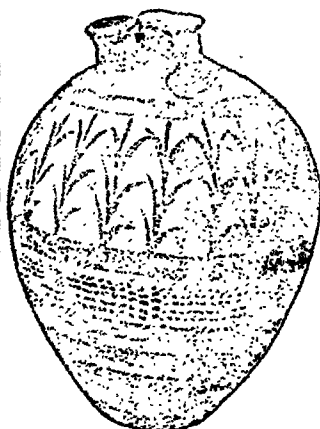
Vase with naturalistic lily sprays



Burial jar from Mochlos



Jug with moulded barley-ears



'Stirrup'-handled vase (Gournia)



Simply ornamented cup



Jar with double-axe motive

OUTPUT OF THE POTTER'S KILN IN A PERIOD OF TRANSITION.

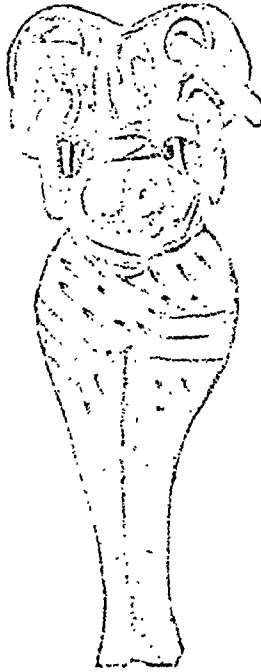
As in E.M. III, so in M.M. III the pottery from a purely aesthetic standpoint suffered a set-back, but the developments are of great interest as foreshadowing the outburst of naturalism in the L.M. periods—note the lily vase above. Polychrome decoration almost vanished, but there were a few survivals, as in the top-right example. Indeed, its chief use was the imitation of ornamental stone.

From Evans, 'Palace of Minos,' Hellenic Society, Seager, 'Mochlos,' Hawes, 'Gournia,' and British Museum

There is apparently no known trace of the Palaeolithic Period in the island. The Neolithic Period is represented, but its remains are poor, both in quality and in quantity. It was not until the introduction of metallurgy that the island sprang into importance and wealth, thanks to its rich store of copper. Indeed, the name of copper, in most of the European languages, is derived from that of this island, so closely is the metal associated with it.

There is a well marked and extensive Copper Age in Cyprus, corresponding to the Cretan Early Minoan, followed by two civilizations in which both copper and bronze are found in use. A clearly demarcated Bronze Age cannot be distinguished before the advent of Late Minoan colonisation.

From a very early date Cyprus maintained a trade with Babylonia, and Babylonian seal cylinders have been found on the island, testifying to the presence there of mer-



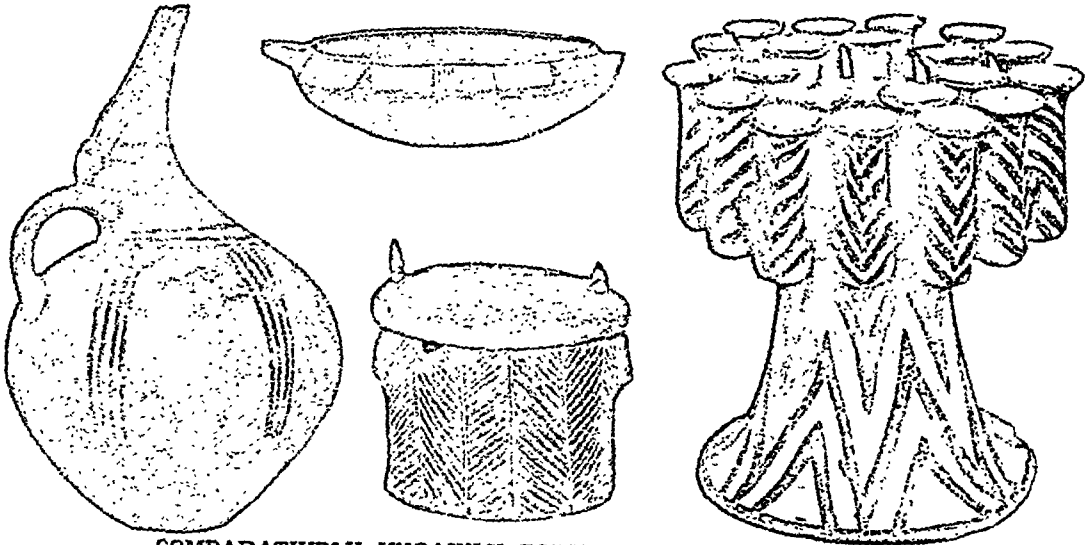
VOTIVE FIGURE

Grotesque though this very early terra-cotta image from Cyprus be, its design is not inartistically conceived and is skilfully realized.

British Museum

chants from Mesopotamia. Later, tablets written in Babylonian cuneiform characters have been found in the Tell el-Amarna correspondence, professing to come from a place called Alashiya. This is generally (though not certainly) identified with Cyprus. If the identification prove correct, then, except for certain parts of Asia Minor, Cyprus will have been the most western country that made use of Babylonian as the language of diplomatic correspondence.

The metallurgists and potters of Cyprus were expert craftsmen; especially the latter. Pottery with characteristic decoration of Cypriote origin has been found in all the countries surrounding the island, from at least 1500 B.C. onward. Cyprus also possessed a peculiar form of writing of its own. Many inscriptions have been found in this script; most of them are in Greek, strangely distorted to suit the exigencies of the character, which is very imper-



COMPARATIVELY UNGAINLY FORMS OF CYCLADIC UTENSILS

Influenced in its early stages by Egypt and to a greater extent throughout by Crete, the pottery of the Cyclades underwent consistent development, yet never achieved the refinement and beauty of its models. The geometrical decoration, for example, painted or incised, remained uncouth. Most characteristic is the oddly shaped jug (left); the large candelabrum-like vase affords evidence of an advance in craftsmanship without a corresponding growth of artistic perception.

British Museum

fectly adapted to express the sounds and words of the Greek language. Others are in a language as yet unidentified and undeciphered, which we may suppose to be the language for which the script was first contrived. The character is a syllabary, each letter representing, as a rule, a consonant with a following vowel. Its origin is unknown: there are certain resemblances which suggest that it may be a simplified form of the Hittite or Minoan hieroglyphs, but until the decipherment of these has been placed on a firm basis by the discovery of a long bilingual inscription, containing many proper names, we cannot be sure that the resemblances are not mere coincidences.

On the mainland of Greece scanty neolithic remains, including painted ware, have been found in the south. Little can be said as yet of the affinities of this civilization, nor can we tell with any certainty whether the succeeding Bronze Age civilizations were imported by invading conquerors or were a natural development of the neolithic aboriginals. The Bronze Age civilization of the southern parts of Greece is divided into the Helladic periods, which follow a course of development similar to that in Crete and the



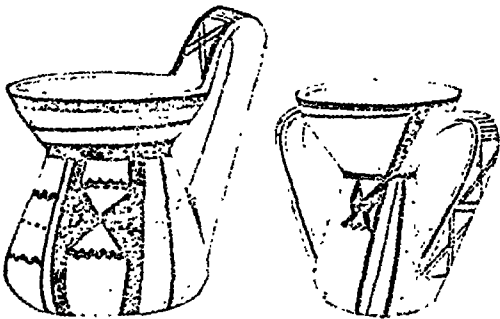
VESSELS OF FINE SHAPE AND SUBSTANCE

On the mainland of Greece excellent pottery was produced (left). Examples of the so-called Minyan and Thessalian vases are also seen above. Typical of the best Minyan pottery is the flat, grey dish with high, upstanding handles (top right); the bowl upon which a wavy design is incised is Thessalian.

British Museum

Cyclades, but with differences of detail. The Early Helladic ware is of coarse texture, made without the potter's wheel, and bearing incised ornament of simple type. Afterwards, a glaze paint is introduced. The patterns are painted in dark colour on a light background.

The special characteristic of the Middle Helladic is the appearance of a ware of uncertain origin, to which the not very appropriate name of Minyan ware has been given. It is a smooth, well turned, wheel-made ware, usually of a grey colour, with polished surface, but without any form of coloured decoration. The vessels that are made of this ware are either wide, flat bowls with two handles that stand up high above the rim, or else large, conical-shaped basins mounted upon a stem decorated with moulded rings. As has been noted above, examples of this type of ware have been found in the Cyclades, in Middle Cycladic associations, but never in Crete. This shows clearly some kind of intercourse between the Cyclades and the Mainland which did not exist at the time between the Mainland and Crete.



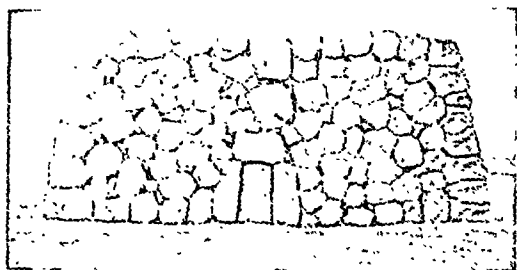
EARLY PAINTED WARE OF SICILY

Of a different type from any other found in the Mediterranean, Sicilian pottery is remarkable for the vigour of its painted decorations; the clay is inferior, however, tending to crack on the surface and the colours to peel.

From T. E. Peet, The Stone and Bronze Ages in Italy

In northern Greece there is another centre of civilization, the history of which has been worked out by the researches of Wace and Thompson. They recognize four Thessalian periods, the first two Neolithic, the others Bronze Age. In the First Thessalian there are all the usual stone implements, some of them in obsidian—an indication that trade oversea with Melos had already been established. In this period the pottery is ornamented with devices in red paint over a white ground. The people lived in huts of brick, and they worshipped deities, of whom they made crude figures.

In the second period, which (especially in the southern parts of its area of distribution) shows strong Helladic influence, much the same civilization is maintained, but the pottery is now decorated with different colours, and the ornamental devices include the spiral. The third period introduces the use of metal, still in comparatively meagre quantities; and,



STONWORK TOMB IN PANTELLERIA

Believed to be neolithic, the 'sesi' on the island of Pantelleria are of solid masonry with an outer casing of large blocks of stone; as seen in this example, they are pierced by narrow passages leading to the sepulchral chambers within.

From T. E. Peet, *The Stone and Bronze Ages in Italy*

strange to say, this advance in civilization is accompanied by a notable decline in art. The pottery is poor and coarse, and the ornamentation is of the simplest and crudest. The terra-cotta figures which are to be assigned to this period are so badly made as hardly to be recognizable as human. Indeed, this artistic inferiority in the native products continues even after 1600 B.C., when the Fourth Thessalian period begins, although its craftsmen had before them imported models in Minoan and Minyan ware.

Unlike the countries with which we have been hitherto concerned in this chapter, the Palaeolithic Period is well

represented in Italy, but with some remarkable limitations. There are many sites in which remains of the Lower or Early Palaeolithic age have been found, especially in the south of the peninsula. Their products are rude, and cannot compare with the finest tools of France.

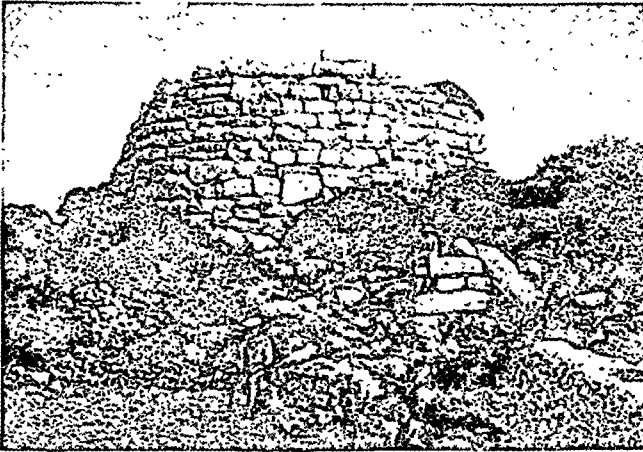
Moreover, there are not wanting indications that this stage lasted relatively longer in Italy than north of the Alps, and that to some extent it overlapped the Middle The Palaeolithic Palaeolithic, which is also Age in Italy fairly well represented.

On the other hand, the Upper or Late Palaeolithic Period has a very imperfect record. Only the earliest phase, the Aurignacian, has been recognized with certainty, and no trace of the pictorial art which is so strongly represented in Spain has been found in Italy.

Rich remains of the Neolithic Period exist over the whole of Italy. These consist of dwelling-sites, both caves and huts, as well as graves. The hut-sites are in the form of hollows in the ground, about 1 foot 6 inches to 3 feet deep, usually circular or elliptical in outline and from 6 to 25 feet in diameter. The hut itself had been constructed inside the hollow, of wattles daubed over with clay. Huts are always grouped together to form villages; in those days no man might live alone; he had to unite with others of his kind for mutual defence against human and animal enemies. These dwellings contain implements in flint—daggers, scrapers, knives, axes, etc., as well as objects in obsidian and bone. Occasionally shells have been found which are not native to the Mediterranean; shells from as far afield as the Red Sea or the Indian Ocean have been found in a hut-site in the neighbourhood of Reggio di Calabria.

Pottery is well represented, and is usually coarse ware, but the vessels are often decorated with painted lines. Other evidences of aesthetic tastes are the 'pintaderas'—stamps of terra-cotta explained as devices for impressing ornamental devices on the skin.

Much care was taken over burials. The graves consist either of caves or else of stone-lined trenches; the dead are usually laid in a crouching posture, and are accom-



MONUMENT WHOSE PURPOSE IS UNKNOWN

A mystery surrounds the talayots commonly found in Minorca, since, while some were certainly used as burying-places, the majority had neither entrance nor interior chambers. Like that shown above, they were solidly constructed of massive stones, and were very probably used for religious purposes.

Photo, Monjo, Mahon

panied with grave-goods, which are frequently broken with intention. The purpose of this is to liberate the spirit of the object, whatever it may be, in order that it may be of use to the spirit of the dead man. The rite thus graphically teaches us that a spiritualised, non-material conception of the state of the dead had already been evolved.

The Stone Age is succeeded in Italy, as elsewhere, by a Copper Age, in which, in addition to the introduction of metal, we find other innovations of importance. The hut dwellings maintain their previous character; but among the tombs, in addition to burials in natural caves and in earth trenches, we now begin to find artificial rock-cut burial places. This points to foreign influence from the east of the Mediterranean, where such tombs had long been in use.

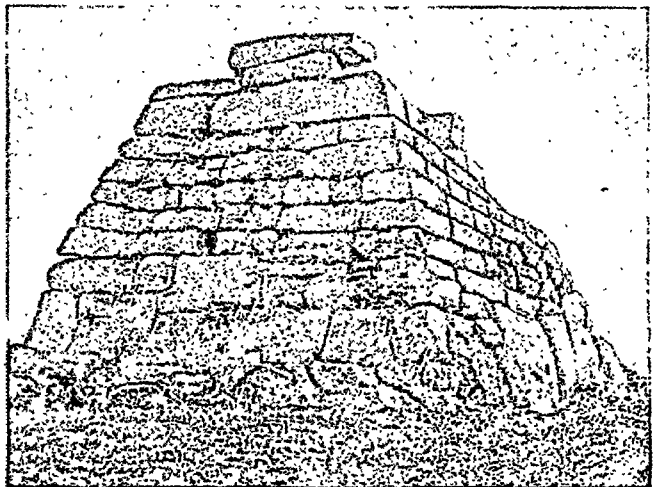
Some of the burial places, such as that at Remedello, contained skeletons, the condition of which suggested that the flesh had been removed, artificially or naturally (i.e., in a preliminary, temporary interment), before the bones had

been deposited in their last resting-place. Among the finds to be assigned to this period are arrow-heads, daggers, knives, etc., of flint or obsidian, polished stone axe-heads and mace-heads, copper celts and daggers. Near Otranto there is a group of dolmens, the only structures of this type in Italy. Sicily has yielded artistically painted pottery belonging to this period which shows close analogy with pottery of the same period from Thessaly.

The Bronze Age in northern Italy is principally exemplified by the lake-dwellings of lakes Maggiore, Como, etc., and by the remarkable pile-villages called terramara settlements.

These, being off-shoots of a more northerly culture, are described in the following chapter and in Chapter 30.

The islands of the western Mediterranean—Sicily, Sardinia, Corsica, Malta, the Balearic Islands and others of smaller size—offer many perplexing problems to the archaeologist. There is no uniformity in their culture; each has its own individual peculiarities, distinguishing it from



TOMB SHAPED LIKE AN INVERTED BOAT

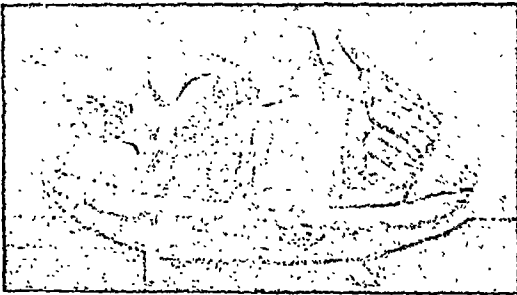
Among the extremely interesting prehistoric remains in Minorca is a class of stone-built tombs, called 'naus'; these are of a peculiar form, but are extremely well constructed. Typical, in its boat-like lines and the massiveness of its walls, is the monument seen here; it is some 40 feet long by 14 high.

Photo, Frederick Chamberlin

the others and from the contemporary culture of the mainland.

Sicily is separated only by a narrow channel from Italy, yet its neolithic culture, if anything, is more closely cognate with that of Crete than of Italy. The small island of Pantelleria possesses a remarkable series of masonry structures locally called 'scsi.' These are, in outline, a truncated cone, circular or elliptical in plan, containing one or more burial chambers approached by a passage to which a doorway on the outside gives access; the remains found within them suggest a neolithic date. The Copper Age in Sicily is of great importance, and displays notable individualities, especially in the design of the rock-cut tombs. Other tombs, lined with stone slabs (after the manner of cists), are known.

Sardinia, the Stone Age of which is little known, is distinguished from Italy by the presence of rude stone monuments, such



FATNESS GRACEFUL IN REPOSE

The neolithic people of Malta seem to have had a respect for corpulence: this model in clay of a statopygous woman reclining languidly on a rocking couch is typical of the many interesting little images found among their remains.

Courtesy of Professor T. Zammit

as are almost absent from the mainland. Standing stones and dolmens are common; in addition to these must be mentioned the remarkable fortified dwellings called 'nuraghi,' and the Giants' Graves which are essentially the same as the rock-cut tombs, but differ from them in being built of large stones instead of being rock-cut. The Balearic Islands possess structures locally called 'talayots,' which resemble in appearance the Sardinian nuraghi, though differing in character. Megalithic remains are also numerous in Corsica.

But it is Malta which presents the greatest number of problems for considera-

tion. This little island possesses some of the most remarkable megalithic structures in the world. The huge temple labyrinths of Hagiar Kim and Mnajdra are unique, and, far more even than Stonehenge, create an impression of mystery inscrutable. No less marvellous is the rock-cut complexity of chambers call Hal Saflicni. These vast works exist, but that is almost all that we can say of them; they guard their secrets well.

Spain is archaeologically one of the most important countries in Europe. It has ever been a half-way house. It lies on the Spain's important most obvious route between Europe and Africa; geographical site it was also an intermediary between northern Europe and the civilizations of the Mediterranean. Its wealth of metals early gave it an exceptional position, and made it a commercial clearing-house. From the earliest Neolithic days Spain was linked with Ireland; and almost as early it had established connexions with the eastern Mediterranean.

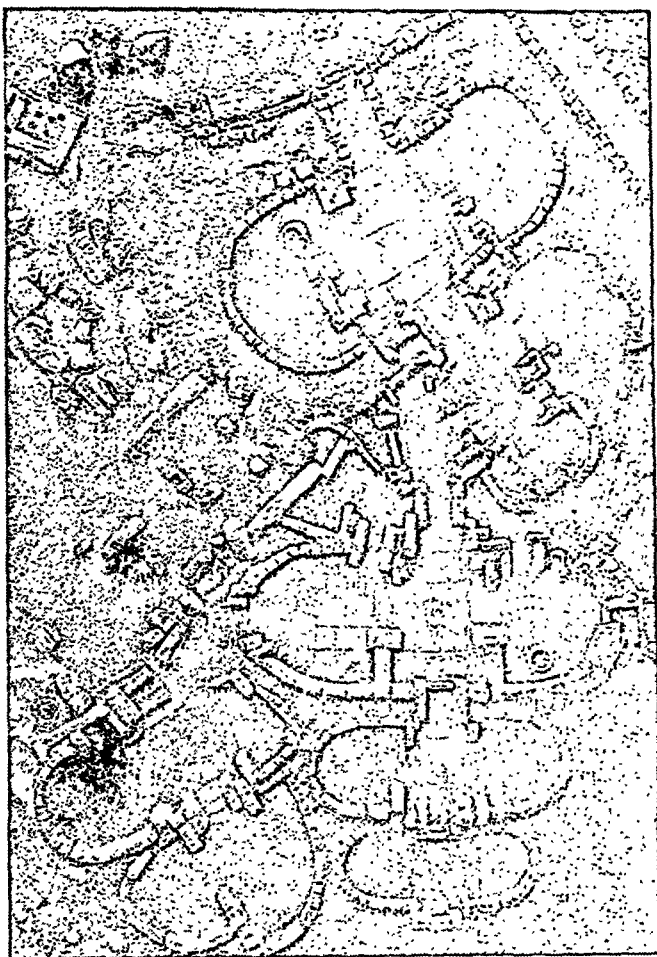
In the first place, unlike most of the other Mediterranean regions with which we have been concerned in this chapter, Spain possesses palaeolithic remains of the first rank, already described and illustrated in Chapters 5 and 6. Secondly, the Neolithic and Bronze Ages have enriched Spain with some of the finest dolmens in the world; and there are many remarkable types of pottery, implements, idol figures, etc., the relationship of which presents problems as yet imperfectly solved. There were undoubtedly both northern and eastern influences at work on the civilization of the country. Further information may be sought in Chapter 21.

Ethnologically Spain shows the Mediterranean race in its greatest purity, as we have already mentioned. But the ethnic history of Spain is extremely complicated. There are probably few territories of equal extent in which a greater number of tribal names are recorded. Most of these are to us mere names; but it cannot be doubted that these names are all that is left of the history of successive invasions of this part of the country or that, and of long and fierce border warfares between communities attracted thereto by its mineral wealth.

The tin mines of Spain were among the chief sources of this metal, which was an absolutely essential commodity during the Bronze Age. Copper is plentiful and widely distributed in Europe; but tin, which was necessary as an ingredient of bronze, is only to be found in certain favoured places. Whoever had a command of those sites could practically command the trade of Europe.

Finally we must say a few words about the early populations of the southern coast of the Mediterranean Sea and of the remains which they have left behind. As yet exploration in these regions has not been very systematic, and there are still large gaps in the available knowledge.

North Africa has yielded implements in abundance which are indistinguishable in character from those of the Lower and Middle Palaeolithic periods of Europe. The Upper Palaeolithic of North Africa (the 'Capsian' culture) is comparable with the Aurignacian or early Upper Palaeolithic of Europe, but with certain local differences. Neolithic implements also are abundant; and associated with the culture to which they belong there are remarkable rock carvings. These, for the greater part, represent animals, as do the paintings in the palaeolithic caves of Europe; but except in this one fact the two arts are widely different. The cave paintings of Europe simply represent animals, and nothing more; they are not shown in vigorous action. The African rock carvings show animals fighting, or carnivores devouring their prey. The African figures show species different from those normally represented in the European caves, and the art, as compared with that of the European Palaeolithic, is despicable.



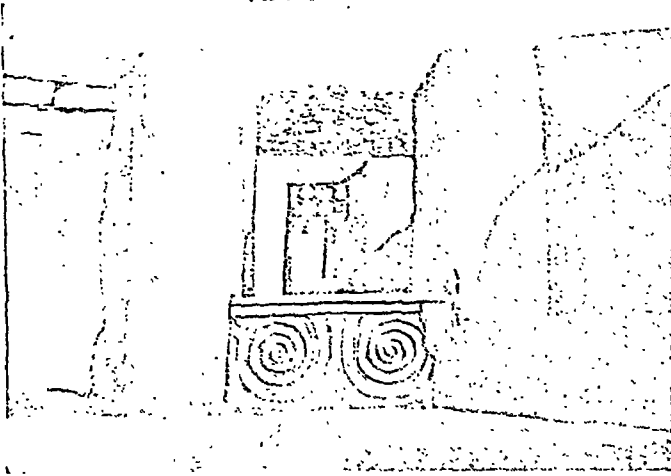
VAST NEOLITHIC REMAINS IN MALTA

Once a temple—or temples if the 'wings' added to the original structure are to be regarded as entirely separate from it—the buildings at Hal-Tarxien are among the most impressive of neolithic ruins in Malta. The apsed, elliptical chambers seen in this bird's eye view are characteristic of such sanctuaries.

Courtesy of Professor T. Zammit

Megalithic monuments, dolmens and stone circles are fairly common in certain parts of northern Africa; these resemble in general character those of Europe, and doubtless are similar in purpose and are the tangible expression of similar ideas. It is very noteworthy that the civilization of Egypt, for all its geographical proximity, has had practically no influence upon the civilization of the remainder of North Africa.

We have now, very briefly, surveyed the whole of the Mediterranean basin, and may pause to take stock of what we have learned.



SIMPLICITY IN TEMPLE DECORATION

The great size and bareness of the stone pillars in the temple at Hal-Tarsien suggest that the neolithic builders fully appreciated the majesty of austere bulk. Even such adornment as they attempted was not elaborate—plain spirals such as are seen on this slab, and friezes of animals.

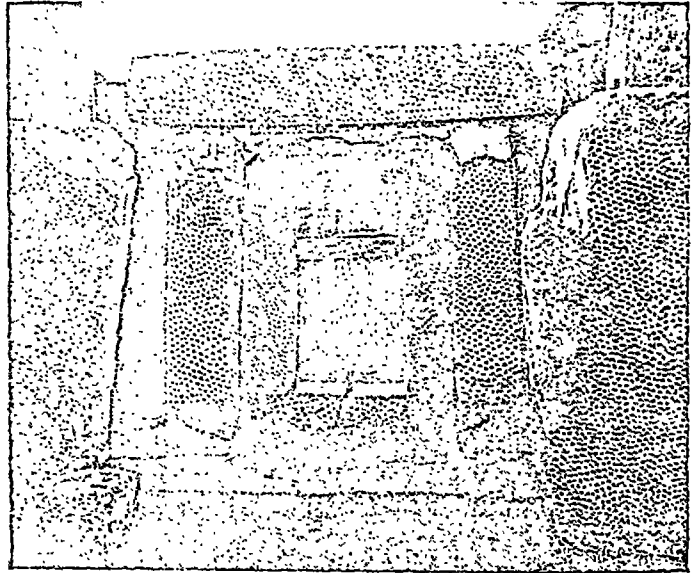
Courtesy of Professor T. Zammit

First, we see how complex has been the history of civilization. Round the sea, except on the east, there is a considerable measure of racial uniformity. We have found the Mediterranean race almost everywhere, and we can also pursue it far north, to Ireland, though that is another story. We find, too, that on the whole there is a climatic uniformity around the sea; and that while no doubt some regions are more fertile than others, or more mountainous, or more liberal in their yield of this commodity or that, yet speaking generally the conditions of life are much the same everywhere. Notwithstanding this, how diverse are the arts, as they were evolved in the different regions! Forms of pottery or of implements appear in one place that are unknown in another. Modes of sepulture likewise show many varieties. Certain communities early acquire the art of writing; others never attain thereto.

And secondly, we learn the importance of the little things of life to the student. Someone has said that 'an inch of

potsherd is worth the whole of Herodotus.' This is a foolish exaggeration; untrustworthy gossip though Herodotus may sometimes show himself, he tells us truths which we cannot learn elsewhere, and we cannot dispense with him. But nevertheless the epigram contains an element of truth. An inch of potsherd, when set beside other inches of potsherd from other regions, may open to us pages of history as rich and as varied as anything that Herodotus has bequeathed to us. With the aid of just such seeming trifles we are gradually fitting together a great mosaic picture of the 'prehistoric history' of the lands that border on

the most wonderful sea in the world. We have at our side heaps of tesserae which we cannot yet fit into their place; but every now and then some new piece comes to light that brings us a stage nearer to the ideal—the unattainable ideal—of presenting a perfect picture, complete in every detail.



GATEWAY LABORIOUSLY BEAUTIFIED

A pitted surface—either of stonework or pottery—was a decorative effect beloved by neolithic Maltese architects and artists. On this temple gateway at Mnajdra the pitting was accomplished by means of flint drills; the rectangular frame within the trilithon was cut from a single slab of stone.

Courtesy of Professor T. Zammit

EUROPE IN THE AGES OF STONE AND BRONZE

The Barbaric Hinterland of the civilized East
and the Megalithic Culture that took Root there

By Sir BERTRAM WINDLE D.Sc. LL.D. F.R.S.

Professor of Anthropology in the University of Toronto; Author of *The Prehistoric Age*, etc.

NOTHING can be more difficult than the attempt to write the history of peoples who lived before written records came into existence. Nothing exists upon which to base the account but the physical remains of these peoples—at the earlier periods very scanty and much disputed—and such of their manufactures as have been able to resist the natural decay of centuries. This means, of course, that we have to rely on objects of stone or other durable material.

Hence, while we have a considerable body of fairly certain facts about the peoples of Europe who lay like a dark background behind the brilliant civilizations of the Mediterranean basin discussed in preceding chapters, the theories which are built on them must needs be largely matters of surmise; and, such being the case, differences of opinion must and do exist—differences that are often fundamental. In this chapter certain facts and surmises will be laid before the reader, with the writer's opinion as to what the evidence at present available seems to indicate with regard to them.

For a very lengthy period—when he was living in what is called the Stone Age, and for the greater part of this, the Old Stone or Palaeolithic Age—Man knew nothing of the use of metals. His mode of life was that of a nomad hunter and fisher; he had no settled home, no idea of agriculture, no flocks or herds. The era of the great early hunters came to an end with what is known as the Azilian Period (see Chapters 5 and 6). Sollas and de Geer seem to be able to show that the probable date of that period was some 7,500 years ago. Everything before that

in the way of dates is mere guesswork, and how uncertain the guesses are may be gathered from the fact that they extend, for the same epoch, from 50,000 to 350,000 years.

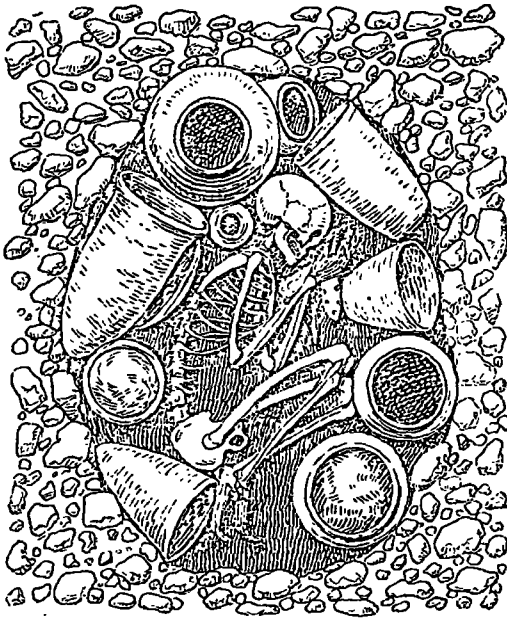
After the Azilian period we have a different form of culture to deal with—that of the New Stone or Neolithic Age. In it, while Man no doubt hunted and fished as he has done ever since, and ate of the roots and fruits which had been so important a part of his predecessor's bill of fare, he had learnt to till the ground and raise crops of the improved descendants of various wild grasses such as wheat, oats and barley. Further, he, or more probably his wife, had succeeded in domesticating the young of the wild cattle of his district, so that he had flocks and herds as well as cultivated land.

All this entails a settled home, and home added to home, so that settlements grew up, and with them an early form of settled civilization impossible to men of nomadic life. But Evolution of the a settled life means that early Settlement there is a danger in the attacks of those still living the nomadic life. Means have to be devised to repel such attacks, and so there arise rude fortifications, ring-fences of earth or stone or both with palisades. Of course the chief objects after which this era is named are the polished and hafted axe-heads of stone that replaced the rudely flaked implements of the earlier era.

Further, Neolithic man made stone adze-heads, with which he fashioned the dug-out boats that he used where he lived in lake dwellings, and he made rude stone saws; so that he was something of a carpenter.

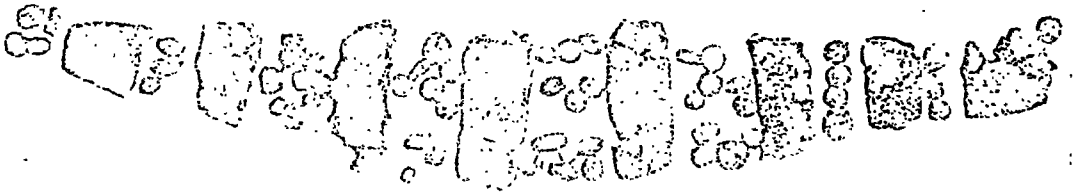
Basket weaving he had learnt, and from baskets lined with clay to keep water from running out of them he had evolved the art of hand-made pottery. The wheel, however, was yet to be invented in the far distant future.

Furs no doubt he used, especially in northern regions, but he could spin and weave and dye. Some details of his dress we may learn from the Later Palaeolithic or transition cave pictures. The agriculturist must know the times and seasons, and as the man we are dealing with had no calendars to help him, it was only by the heavenly bodies that he could keep track of time as it sped on its way. So he became an astronomer and constructed wonderful buildings, which will be described later; these were his observatories and very possibly temples also.



Earlier races (see Chap. 6) had been gifted with a wonderful natural artistic genius. The Neolithic man with whom we are dealing was not remarkable for this quality; his mind ran on geometrical figures, which he reproduced in the adornment of his pottery. Whether any of this ornament had a religious significance, as was the case with that of the earlier Aurignacian era, it is not possible to say with certainty, but it is quite likely that the solar and lunar symbols may have been thus conventionally represented. Again, the figurines of women with their feminine characteristics exaggerated—earlier types of which existed in Palaeolithic days—may be linked with similar objects which in later periods were certainly associated with religion.

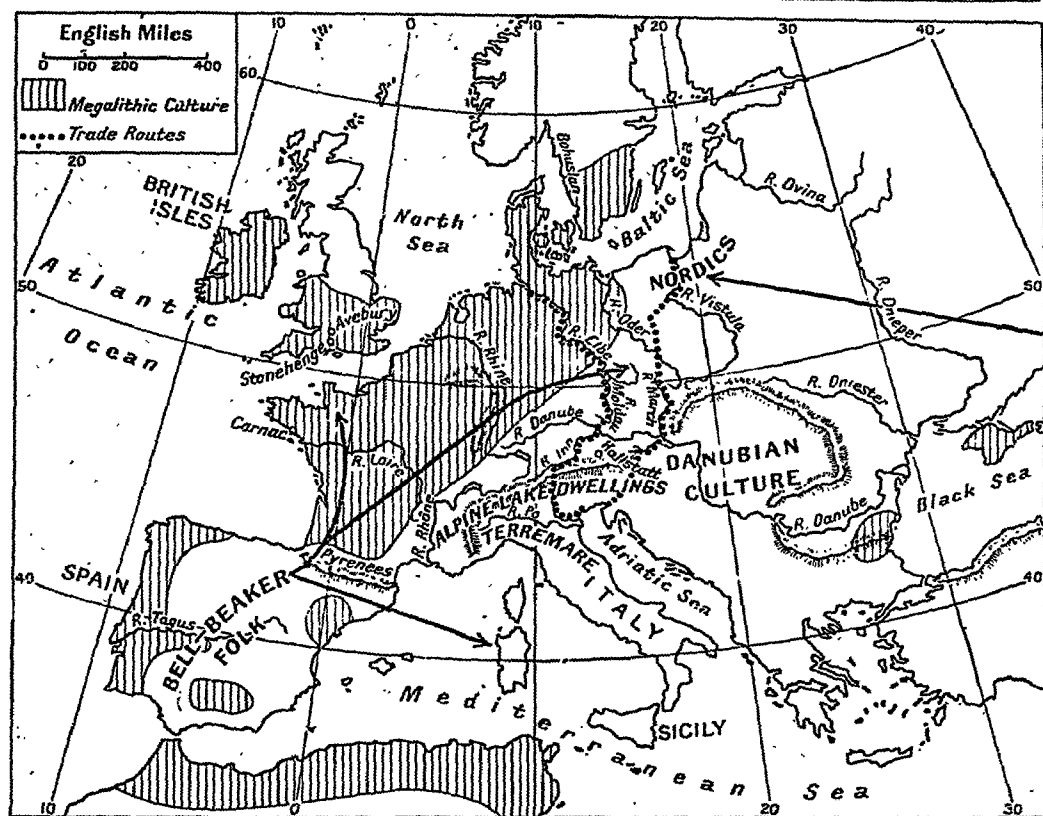
That Neolithic man believed in a future state is unquestionable; and the gifts that were placed beside a dead body when it was buried are so numerous—especially in the earlier part of the era—as to make one think that, like the modern gypsies, he did not suppose it right to retain any of the portable property of the deceased man or woman. This property often included personal ornaments, shells and beads of amber once linked together as necklaces or bracelets. Sometimes amber is found in enormous quantities in jars in the interments, one of these weighing seventeen pounds and containing no fewer than four thousand articles. This is eloquent testimony to a firm faith in another world, which it would be supposed was not very different from this one; in it at least the departed soul decked itself in a very human fashion.



GRAVES PROVIDE EVIDENCE AS TO MATERIAL AND SPIRITUAL CULTURE

The care with which the dead were buried in the Neolithic Age, with their possessions disposed about them, shows that there then existed a strong belief in the immortality (and potential vindictiveness) of the soul. In the graves pottery is usually well represented, as in the neolithic Egyptian interment (top), and weapons are common. Almost as widespread and even more interesting are small ornaments of amber (below); they are generally pierced, having formed parts of necklaces.

From de Morgan, 'Prehistoric Man,' and British Museum



DISTRIBUTION OF NEOLITHIC AND BRONZE AGE CULTURES IN EUROPE

Even in the Neolithic Age lines of intercommunication, trade-routes, had been opened up throughout Europe. The most important were the two, traced above, by which the eagerly demanded amber of the Baltic was brought to the Adriatic; the more easterly was developed the later. A very remarkable phenomenon was the advent of the megalith builders—perhaps from the East, perhaps only inspired by ideas derived from the East—and their wide diffusion round the coasts of Europe.

It also affords equally strong evidence, however, of extensive trade, since the source of amber is the Baltic. The fact that goods were conveyed to and from different parts of the continent implies that there were trade routes, and traffic on these trade routes would mean that intercourse between distant populations had been established; and, therefore, that civilization was being extended and broadened. We know fairly well how these trade routes ran; indeed, they might be deduced from an examination of the map of Europe.

The most important of them started at the Adriatic, where Venice was afterwards to arise, passed up the Adige, through the Brenner Pass, down the Inn to Passau, through the Bohemian Forest to the Moldau, and then down the Elbe to the North Sea. A later one, starting at the Gulf of Trieste, ran north-east through Laibach to

Graz, then down the Leitha to the Danube at Bratislava; up the river March; through Moravia and Silesia; along the Oder; across Posnan to the Vistula; and ended at Danzig. There were also the natural routes of the Rhône and the Rhine valleys and the Atlantic and North Sea coasts from southern Spain to Denmark. (For the development of these trade routes see further under Chap. 30.)

A remarkable feature of this time was the construction of monuments made of great stones, termed megaliths. As the whole matter is closely concerned with the disposal of the dead we may consider that question first of all. Inhumation, the burial of the entire body in a cave or in a hole in the earth, is the older method; it was only later that the practice of cremation was introduced. It is thought to have marked a change in religious



BOWL OF A TYPICAL PATTERN

The food vessels of the Bronze Age were in Britain almost certainly developed from neolithic bowls of the style of this example. It is of crudely baked clay, shaped without a potter's wheel, and decorated with basket-work designs.

British Museum

opinion. Whether the fire was regarded as a purificatory ceremony for the benefit of the soul, or as an effectual means of laying a possibly troublesome ghost, or neither, we cannot tell. Certain it is, however, that the two practices for a time co-existed side by side. Cremation (discussed further in Chap. 30) is first found during the later part of the Neolithic Era, and was practically universal during the later part of the Bronze Age.

But in the earlier time the bodies were laid in stone tombs known as dolmens; these have the appearance of huge stone tables, the literal meaning of the name given to them. In their simplest form they consist of two or more stones fixed upright in the earth on the top of which a third, often of great size, is laid flat so as to form a roof. The bodies were deposited within, and the whole covered by a mound of earth. Such is the typical and classical dolmen, often called a Druidical Altar, a term that is a relic of the days when unknown objects were associated with the mysterious Druids. To-day in many books it is not unusual to find included under the term 'dolmen' more complicated burial places, such as chambered cairns, allées couvertes, Hunnenbetten and the like. The collocation is misleading, though all are sepulchral, all of this period and all, no doubt, modifications of the same type.

The dolmen has a wide distribution, which must now be described. If we consider the southernmost group, we remark that the dolmen is to be found in the Sudan, Egypt, Tripoli, Tunis, Algeria and Morocco. Farther east, it is to be found in India, Syria, Palestine, the Crimea, the Caucasus and Bulgaria. There are examples of dolmens elsewhere in Europe—in Spain, Portugal, France, Belgium, Holland, North Germany, Denmark, Sweden, Norway, Western England and Ireland. Let us notice the gaps: dolmens have not been discovered in south Germany, nor in Hungary, nor in Greece. These facts need explanation, and some people have suggested that there once lived a dolmen-building race.

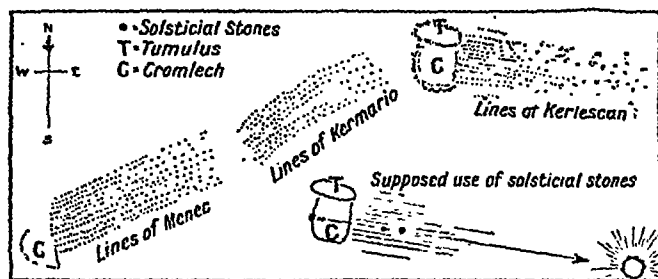
Such a supposition is not necessary, however, since a religious idea would account for the buildings, and religious ideas are capable of very rapid propagation. But again, do we need this explanation? The answer lies in our attitude to one of the most disputed questions of the day in ethnological circles. Can a cultural fact ever be independently invented in different places? Some argue that such a phenomenon never occurs; others that it does, but that re-invention is less frequent by far than diffusion. It suffices to say that, while the plan of the simple kind of erection described above is one which might easily have been conceived independently by men far apart from one another, it is clearly proven by the facts that there



SIMPLE DOLMEN IN KENT

A table-like structure of vast stones, Kit's Coty House at Aylesford is typical of the less elaborate dolmen-tombs. The body was placed within the dolmen—a kind of cave-burial, since the whole was heaped over with earth.

Photo, Frith & Co.



SIGNIFICANCE OF MEGALITHIC AVENUES

Of the three huge avenues of standing stones at Carnac one, as shown in this plan, faces the east, and two the north-east: that is to say, they point towards sunrise respectively on midsummer's day and on the two equinoxes, clearly proving their builders' preoccupation with the sun.

are regional gaps, though stone in those regions was not lacking for the building of dolmens. Above all, it can be shown that, in western Europe at any rate, the dolmens do cluster round those districts which produced copper, tin, amber and gold and were accessible to sea-borne traffic—all which suggests a common source whence the practice of dolmen-building diffused.

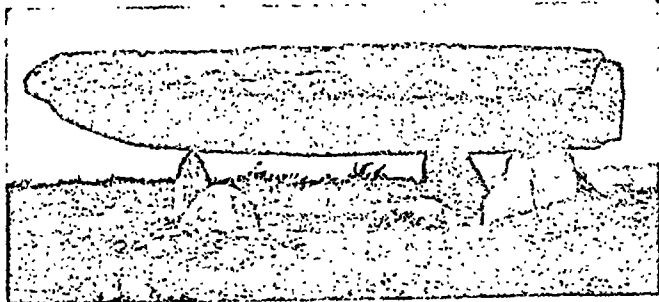
If so, where did the original conception originate? There is an important school that locates the beginnings of all ideas in Egypt, and to that school the dolmen is derived from the 'mastaba' type of early Egyptian tomb (see page 503). Thus what is now called the Heliolithic Theory, in which is included an answer to the dolmen question, teaches that from Egypt came the ideas which influenced not merely Europe but the East as far as China, and, beyond that via the Pacific islands, Mexico and perhaps other parts of the New World. Many think that this vast edifice of admittedly fascinating theory is built upon a very small foundation of ascertained fact, and believe that the dolmen was introduced to Egypt from Syria, or to both from some third undetermined spot. Yet another view is that the dolmen originated in the Iberian peninsula, in the basin of the Tagus, and thence spread through Europe, being derived from cave tombs; it is suggested, indeed, that both dolmens and cave tombs were merely modifications of the

rock-cut tombs of southern Sicily.

From the dolmen we must turn to the consideration of other forms of megalithic monuments. The simplest and most wide-spread is the menhir, or standing stone. The idea of setting a stone on end in the ground has occurred to the minds of people in all parts of the world, and such stones have been employed for a multiplicity of purposes. It is recorded, for instance, that

Jacob erected a stone of memorial; and many others have always been used for this object, as well as for pointers for astronomical purposes, it would seem, and as landmarks.

Strictly speaking, a single line of these megalithic standing stones is what is known as an alinement; many of these are to be seen in south-western England. Dual, triple or multiple rows of such stones are often loosely called by that name by writers of to-day, but the word 'avenues' is better, since it distinguishes them from the single row. Both the single and the multiple stones are sometimes of an immense size. The giant specimen at Locmari-aquer in Brittany, for instance, has been in four separate pieces since



TOMB CONSTRUCTION IN BRITTANY

In the great dolmen known as the 'Table des Marchands' at Carnac, the immense, monolithic roof was supported by several side-stones, so that it is more complicated than Kit's Coty House. On the left-hand end stone (above) is carved a design thought to represent wheat ripening in the sun.



MOST EXTENSIVE OF THE MONUMENTS OF THE MEGALITH BUILDERS—

The disposition of the stone avenues at Carnac suggests some ritual purpose, as their orientation indicates a connexion with the worship of the sun. They run in orderly fashion uphill and across flat country, affording either processional ways or long vistas down which worshippers might watch the rise of their god. The avenue of Menec is the largest of the three main groups of standing stones.



MENHIRS IN ONE OF THE GREAT ALINEMENTS OF KERLESCAN

Imposing as they are in isolation, menhirs are more definitely awe-inspiring when arranged in long ranks, as at Carnac. The magnitude of the accomplishment of the ancient people who constructed the avenue is suggested by the dimensions of the stones seen here; and many of those that go to form the alinement of Kermario are even larger. At the western end of the avenues of Kerlescan is a ring of standing stones, interesting in that it is almost complete, but not perfectly circular in shape.



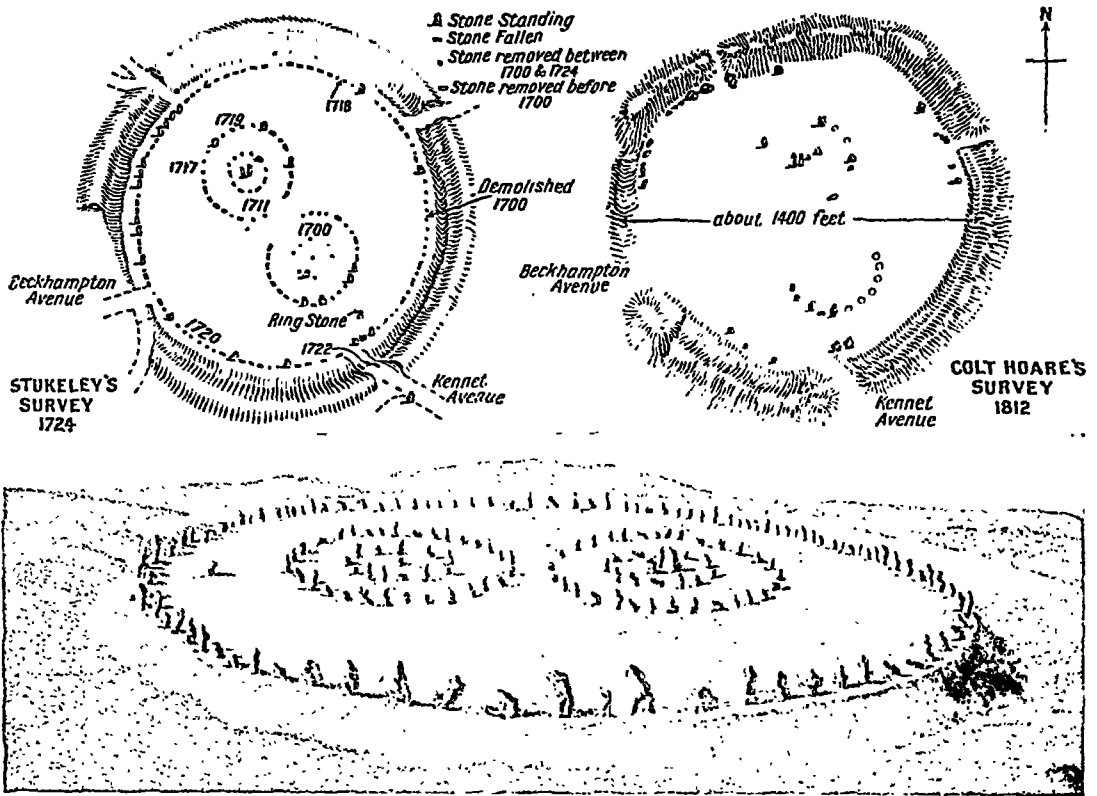
—THE DAMAGED BUT STILL VAST AVENUE OF MENEC IN BRITTANY

About a thousand yards in length, and consisting of more than a thousand upright stones arranged in eleven alignments, the avenue of Menec covers a greater area than those of Kermario and Kerlescan, near by. Originally, at the south-western end of the avenue, there was a cromlech, or circle of standing stones (see plan in page 621), 100 yards across, but it has been broken by modern buildings.



RELIGION EXPRESSED IN THE ERECTION OF GIGANTIC STONES

The early dolmens, like that of Kergavat (left), were constructed of massive slabs and blocks of untrimmed stone; in later examples the uprights were made much smaller, and eventually their place was taken by carefully constructed walls. The purpose of menhirs, single standing stones often of great size, is not known, but it is supposed that they were connected with a fertility cult. Here we see the huge, isolated monolith known as the Giant of Kerderf, at Carnac: it is about 19 feet high.



HOW ENGLAND HAS TREATED HER GRANDEST MEGALITHIC MONUMENT

The reconstruction of the great circles at Avebury is a difficult matter owing to the vandal destruction of their constituent stones by local farmers—sometimes to clear tillage, sometimes apparently in wanton destruction; the two old surveys show the amount of damage wrought in a single century. Luckily these same surveys preserve much of the otherwise irrecoverable information, and indeed Colt Hoare was able to publish the restoration below, as good as any now likely to be made.

After Colt Hoare, 'Ancient Willshire'

its fall, but it was sixty-seven feet high in the days of its greatness. It is in Brittany that the greatest avenues are also to be found. At Carnac there are three groups—the lines of Menec, which consist of eleven rows of menhirs, each from three to thirteen feet in height, making a total of 1,169 stones; those of Kermario, ten in number, and comprising 982 menhirs; and the thirteen lines of Kerlescan, which consist of 540 stones with a circle at the western termination. At Erdeven, another site, there are 1,129 stones in thirteen rows extending for one and a quarter miles. Professor Déchelette has stated that these are the only true alinements in existence, but there is no reason whatever to deny that title to the much smaller examples of Wilts and Devon.

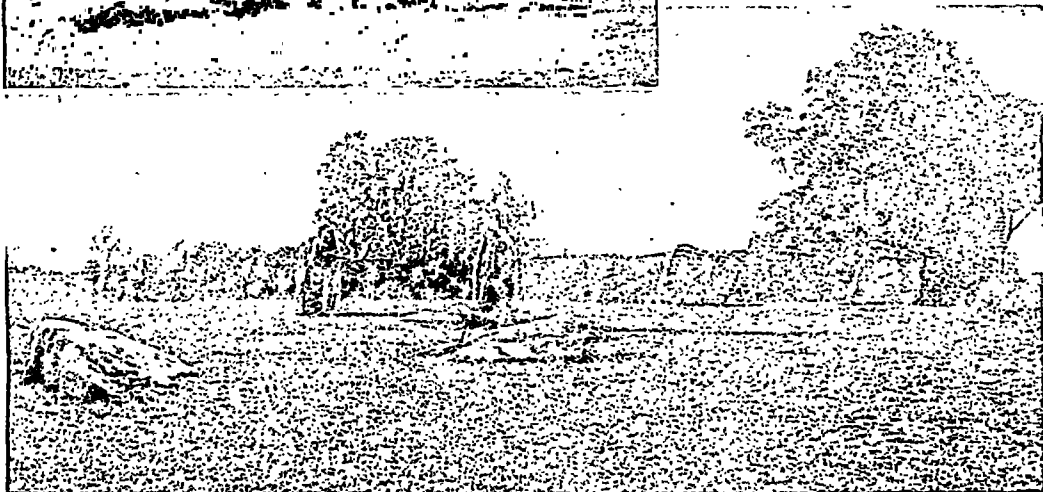
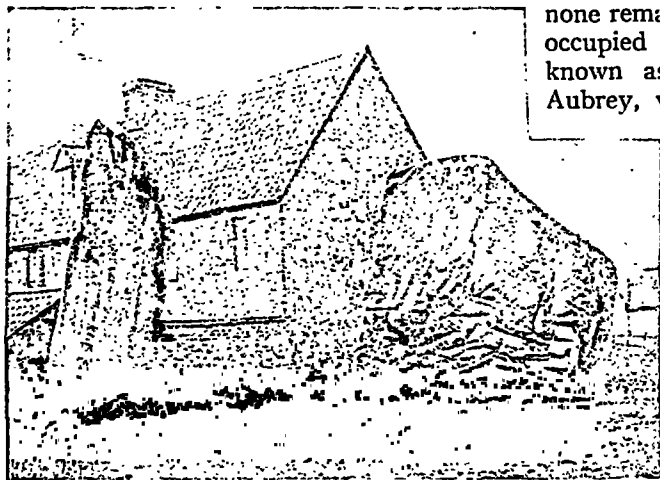
The Carnac group have a connexion with the sun, for two of them face north-east, and the third east—that is, towards

sunrise and the sun at the solstices. But this matter of the astronomical importance of such early monuments may be more suitably dealt with in connexion with the next form of megalith, the stone circle. Sometimes called cromlechs ('bent stone' is the literal meaning of this word—which should not be used, since it is misleading and ambiguous, having in the past been attached to dolmens and other objects), these erections are in fact circles of stones, and there is no reason why we should not simply refer to them as such. The circles vary in diameter (one hundred feet is not an uncommon measurement), and are formed of standing stones of varying height—very often they are quite small. In many cases in Great Britain and elsewhere the circle is connected with one or two avenues. As the largest example of this kind of monument is the great collection of stones at Avebury in Wilts, that may now be described.

'Avebury doth as much surpass Stonehenge as a cathedral doth a parish church,' said Aubrey, that genial recorder of the lore of the late seventeenth century. A certain Farmer Green of evil memory, however, removed many of the stones, and the circle is now sadly reduced, though still a thing to inspire wonder. In the first place it covers twenty-eight and a half acres, and within the ditch that surrounds it is a little village with church and manor house. The rampart and fosse form a circle 1,400 feet in diameter; and, as the ditch is inside the bank, the erection cannot have been of a military character. The depth of the ditch even to-day is forty feet. There are two avenues, from which, however, the standing stones have been freely

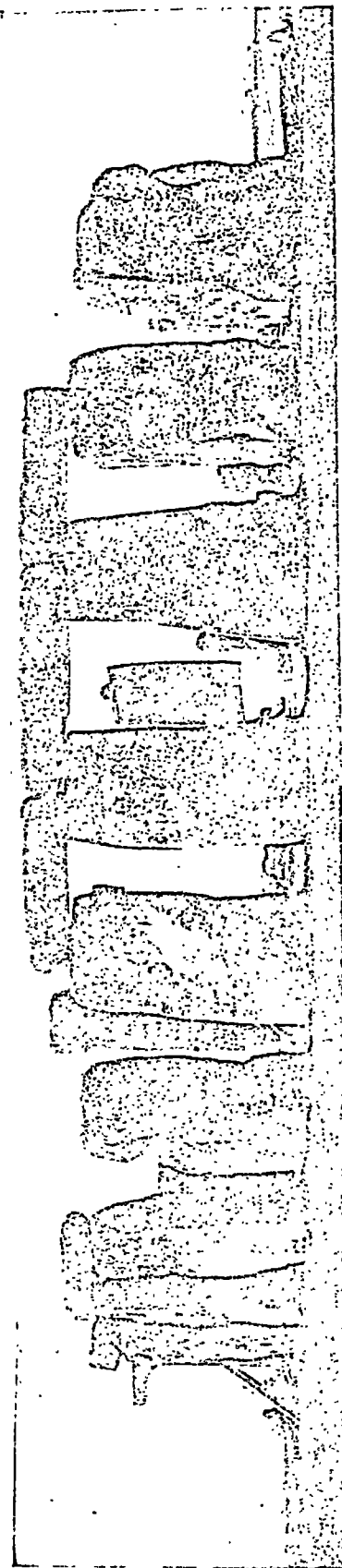
removed. Within the ditch there was originally a wide circle; and within this double ambit were two circles, each double and concentric, and each containing in its centre what has been called a 'cove'—some arrangement of stones, that is to say, perhaps taking the form of a dolmen. It is the largest building of its kind in existence, and is similar to the early Breton type.

Stonehenge, an erection of later Neolithic times, is far more widely known than the Avebury stones, and in connexion with it are many points of interest with which we must now deal. It has a ditch and a rampart, which is quite low in comparison with that at Avebury and encloses an area only 300 feet in diameter. Within this was once a circle of stones, of which none remain, though the holes which they occupied have been discovered—they are known as 'Aubrey holes,' from John Aubrey, who mentioned them and thus caused search to be made for them. From the north-east side an avenue, now devoid of stones and merely a double embankment, passes out; in the middle of it is a menhir known as the 'Friar's Heel.' Within the ambit of the Aubrey holes is a

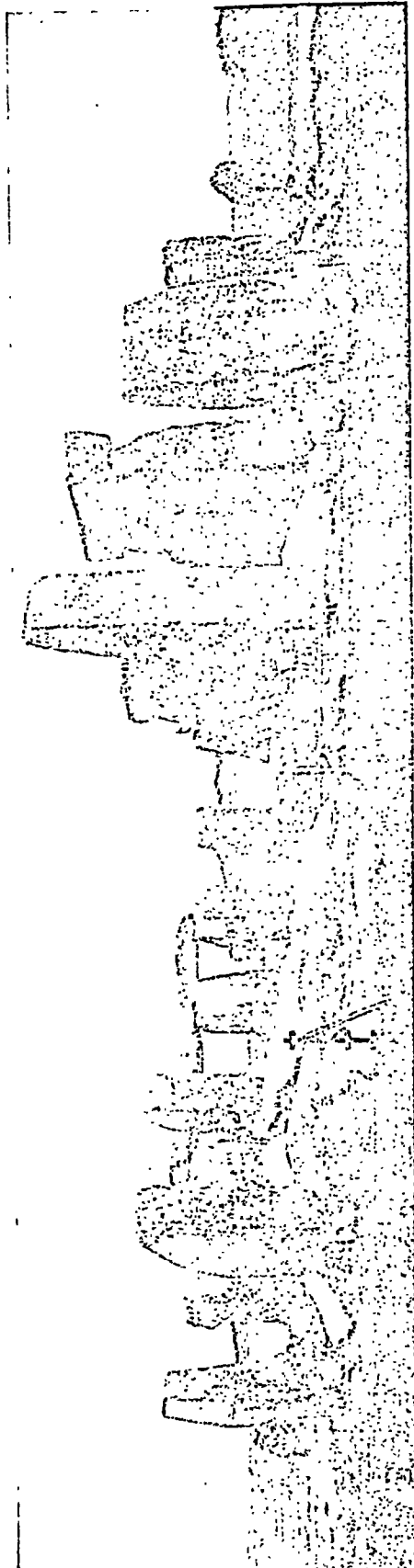


SCATTERED REMAINS MARKING THE SITE OF A VAST MONUMENT

Consisting originally of a wide circle containing two smaller, double rings of stones, the Avebury works were surrounded by a rampart and ditch, and were approached by two avenues lined with menhirs. The immense size of individual stones is readily appreciated when we see these two beside a cottage of two storeys. Surviving menhirs that once formed part of the outer circle and the southern inner circle (lower photograph) also testify to the megalith builders' engineering skill.



Without doubt one of the most remarkable neolithic monuments in the world, Stonehenge, on Salisbury Plain, is absolutely unique in several respects. The great monoliths that form its arches, for example, are carefully and skilfully shaped; and the imposts, or lintels, are secured to the uprights by very competent joints—from the nature of these it is argued that the builders of Stonehenge were able wood-workers who had turned to stone-cutting. Here we see the outer circle of the huge monument from the east; it is constructed of 'sarsen' stones, that is, stones quarried locally.



Inside the outer circle of arches at Stonehenge was a concentric circle of smaller stones which are described as 'foreign', i.e., not obtained in the vicinity. Inside this, again, were five trilithons, arranged to form a horse-shoe, which contained a group of 'foreign' stones similarly disposed; within them was the Altar Stone. The opening of both horse-shoes faced the north-east. The tallest monolith is the one remaining upright of the 'Great Trilithon'; of the original five trilithons two are still intact and are here seen from the west, one to the right of the Great Trilithon, the other behind it.

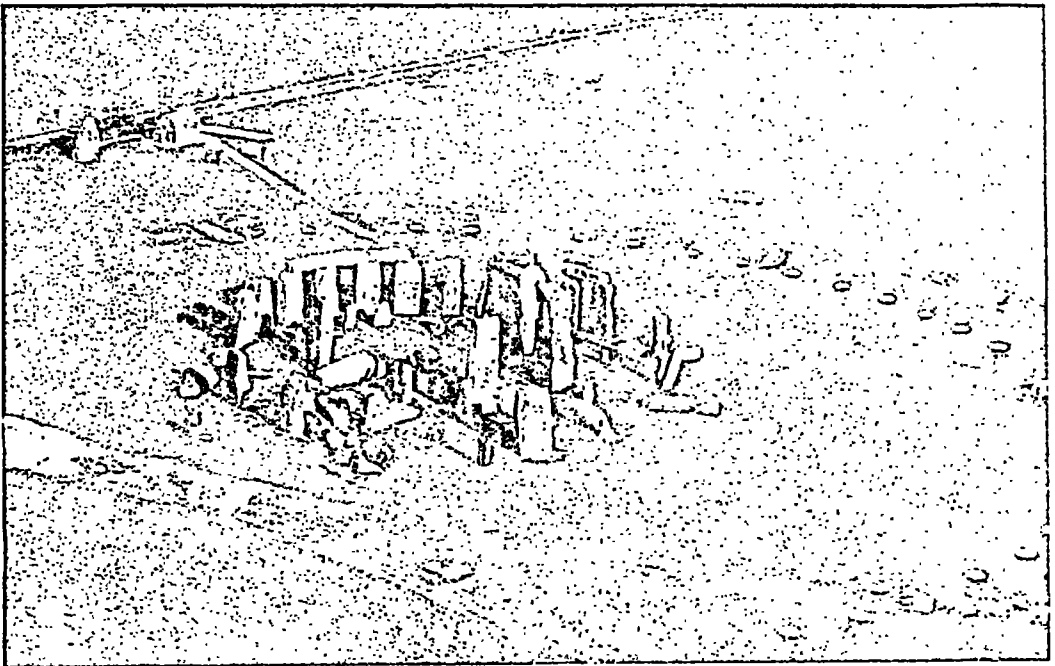
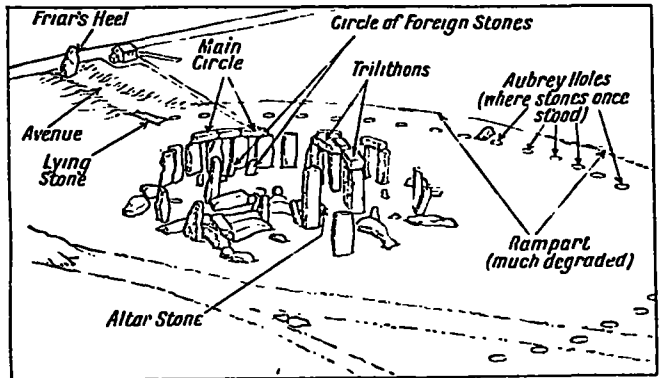
WONDERFUL RUINS OF STONEHENGE BELIEVED TO HAVE BEEN A SANCTUARY OF NEOLITHIC SUN-WORSHIPPERS

Photos, Friih & Co. and Photochrom

circle or hedge of shaped pillars with imposts. This is absolutely unique, for there is no other circle which has such imposts, nor is there any other in which the stones have been shaped. Further, the lintels are held in position on the uprights by a mortise and tenon joint, also an individual characteristic of the ring at Stonehenge, and one that shows a knowledge of carpentry. Within this is a circle of much smaller stones, unhewn and without imposts, but they are in some ways the most interesting feature of the whole group.

Unlike nearly all the other stones, which are 'sarsens' of the kind found scattered all over Salisbury Plain, these stones are foreign, and there has been much controversy as to the place of their origin. Opinion to-day considers the Prescelly Hills in Pembrokeshire, just above Fishguard, 180 miles to the west of Stonehenge, to be the place.

Nobody can say why they were brought from this great distance. They may have been the stones of some sacred edifice removed by emigrants or seized as trophies of war; we cannot tell. At least it is interesting to recall the fact that Geoffrey of Monmouth, Bishop of St. Asaph, writing in the twelfth century, declared that the stones of Stonehenge had been brought from the Curragh of Kildare in Ireland by the magic of Merlin to please Aurelius Ambrosius, a



THE REMAINS OF STONEHENGE SEEN FROM THE AIR

Although the great structure has suffered considerably with the passage of years, enough remains to enable us to realize the pristine grandeur of Stonehenge. The surrounding earthwork, which has a diameter of about three hundred feet, is clearly perceptible; the white marks within it indicate the points at which the foundations of an outermost ring of standing stones have been discovered, though the stones themselves have disappeared. The key diagram above distinguishes the component parts.

Photo, Central Aerophoto Co., Ltd.

vague Romanised British hero, who was supposed to have lived in about A.D. 470. There is some great secret unrevealed concerning these Prescelly stones, and we are never likely to discover what it is.



Within them, again, were five great 'trilithons,' only two of which are standing to-day. Each of these is like a detached segment of the ring of pillars and imposts, but is of much greater size. They formed a horseshoe; within it was a second horseshoe of foreign stones, and within that again there is a flat stone lying on the ground known as the Altar Stone. This, the only other foreign stone in the group, may have come from Somerset. When the sun rises on midsummer day, its rays, if visible, stream over the Friar's Heel, across the Altar Stone and through the aperture of the great central trilithon of the five. That such an arrangement should be regarded as accidental would be to stretch the long arm of coincidence altogether too far.

There is a great controversy over the solar nature of the stone circles, some flatly refusing to believe in it. My own observations of Irish circles, astronomically checked by my cousin, Admiral Somerville, and his own work on a number of other circles, leave no doubt in my mind as to the genuineness of the theory.



HUGE MONOLITH THAT WOULD BE ALL IMPORTANT TO SUN-WORSHIPPERS

At the summer solstice the sun rises over the Hele Stone, or Friar's Heel, which stands on the common axis of the two circles and two horseshoes at Stonehenge; the lower photograph was taken at dawn on Midsummer's day. The beams of the rising sun would fall across the Altar Stone and strike through the arch formed by the aperture of the 'Great Trilithon.' These facts, with the rest of the relevant evidence, seem to establish Stonehenge definitely as an ancient temple of the sun.

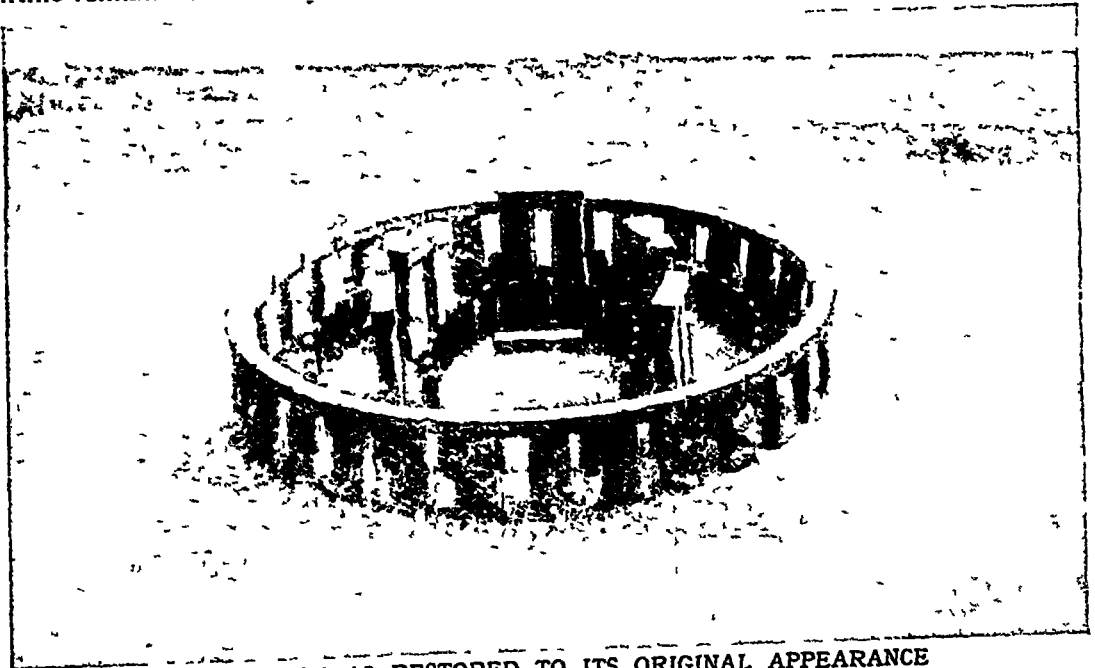
Photos, Tomkins & Barratt and Mullins

The people who erected these circles were agriculturists, it was of great importance to them that they should be able to mark the passage of the seasons, and they had no clocks and no calendars. Those are the basal facts. The theory suggests that circles like Stonehenge and others were solar—or in some cases stellar—observatories, by means of which the flight of time could be observed and the farmer made aware when his spring operations should commence.

Of course, the exact point of rising of the sun shifts very slightly from year to year, and from calculations based on that fact Sir Norman Lockyer estimated that Stonehenge was erected in about 1800 B.C. Professor Gowland, when examining the circle at the restoration of the stone which fell on the night of December 31, 1900, came upon evidences of copper which led him to think that the monument was of the very end of the Neolithic Period just as it merged into the Chalcolithic, or the age when stone and copper were in simultaneous use. At any rate, its character entitles us to believe that it was the latest of all these monuments. Like the megalithic remains in Brittany it was obviously

a holy place, if we may judge from the number of interments around, these being far more numerous than in any other part of the county. To conclude this matter, the great engineering skill necessary for the erection of all these monuments must be noted and admired.

It is now time to turn from their relics to the races (as distinct from cultures and social groups) of the period which we are considering, and a study of them must be prefaced by some remarks on that thorny problem, the peopling of Europe. Where the earliest people came from we do not know. It is supposed, however, that towards the end of the Palaeolithic Age a considerable part, at any rate, of western Europe was inhabited by the Magdalenian race, which had come into Europe from the steppe regions, with a fully developed art of its own, and spread down to the Pyrenees (see also, however, under Chap. 5). There seems to have been in North Africa a race called the Capsian, which somewhere around 7000-6500 B.C. immigrated into Spain and advanced northwards, eventually pushing the Magdalenians out of its way and reaching Britain about



STONEHENGE AS RESTORED TO ITS ORIGINAL APPEARANCE

While there is much that is likely to remain inexplicable in connexion with Stonehenge, definite suggestions as to its appearance when undamaged are afforded by the ruins, these are all realized in this very convincing model restoration. The imposts of the outer circle of standing stones, it will be seen form an unbroken ring while the trilithons of the horseshoe are separated by regular gaps. The position of the largest of these trilithons in relation to the Altar Stone is well shown.

Photo by S. Sutton of a model in Salisbury Museum

5000 B.C. These Capsians seem to have belonged to the great Mediterranean race. One thousand years later—pray remember that all these dates are exceedingly tentative—the Alpines, so called from having been first recognized in Alpine districts, began to seep into Europe from the east. Before dealing with them, however, it will be necessary to glance at the physical geography of the continent.

In the first place, we have the vast northern plain extending from the North Sea to the Altai Mountains near Mongolia, broken only by the Urals, and then

not seriously, for their altitude is not great. In the south we have another great plain terminated at its southernmost edge by the Sahara; and here, logically, Europe may be said to end, since the Mediterranean is only an incidental lake, and not so long ago was two lakes with land bridges at Gibraltar and Sicily. This southern plain extends from Morocco to Mesopotamia. Between these plains is a mountainous core or Highland Zone, running from the north-east to the south-west. It has its beginning in the east, in those highlands of Armenia that are connected with the North Persian mountains, the Zagros range and the ridge running through Syria to Palestine. From this starting-point it works across Europe to terminate at the Pyrenees, being for the greater part of its length an upland, moist, forested district.

At the eastern end of this region we find people of the Armenoid or Anatolian race (see page 228). They have extraordinary flat-backed heads, so extraordinary that it was once imagined that the deformity—if such it may be called—was artificial. These heads, like those of the Alpines, are of the broad type.

No observant person looking down on the heads of a crowd from a gallery in a theatre or elsewhere can fail to note that some are long and narrow, some much more nearly approaching the circular. Anthropologists call these respectively dolichocephalic and brachycephalic skulls, but let us be content to call them long and broad. These two shapes of heads are very important factors in trying to arrive at definite facts as to the early history of

Europe, as has already emerged in Chapter 5; but it is necessary to note that there are numerous forms intermediate between the long and the broad, as indeed one can see from one's gallery observatory. So far as we know, the majority of the peoples existing in Europe up to the time with which we are now dealing were all of the long headed type.

Now, however, we have a broad headed race making its appearance. It may have had its cradle in the plateau surrounded by the mountains of Asia Minor that lies immediately west of the Armenian mountains. Neolithic implements are common in this district, and these peoples came into Europe, it is thought, about the time of transition between the Old and the New Stone Ages. Perhaps a few made their appearance in this continent during Palaeolithic times, but a few only; it is generally accepted that the real invasion took place after the end of that era. Whether this broad type of skull was developed by reason of long dieting on nuts, roots and the like, instead of flesh as the main food, is not certain, but several facts point in that direction.

The main current of Alpo-Carpathian newcomers was related to the peoples of the mountains and plateaux that stretch from the Himalayas westward. It made its way to the Balkans and along the Mountain Zone we have been considering. The principal eastern groups of these people are known to-day as Slavs; to the west are the 'Cevenoles' or 'Auvergnats' with the broadest heads in France, living in the Ardennes, in the Vosges and in the central plateaux of France in scattered communities. The Illyrio-Anatolian group comprises the Armenians—with whom the Hittites were connected—and the Illyrians or Dinarics of the Adriatic, a variety of the above.

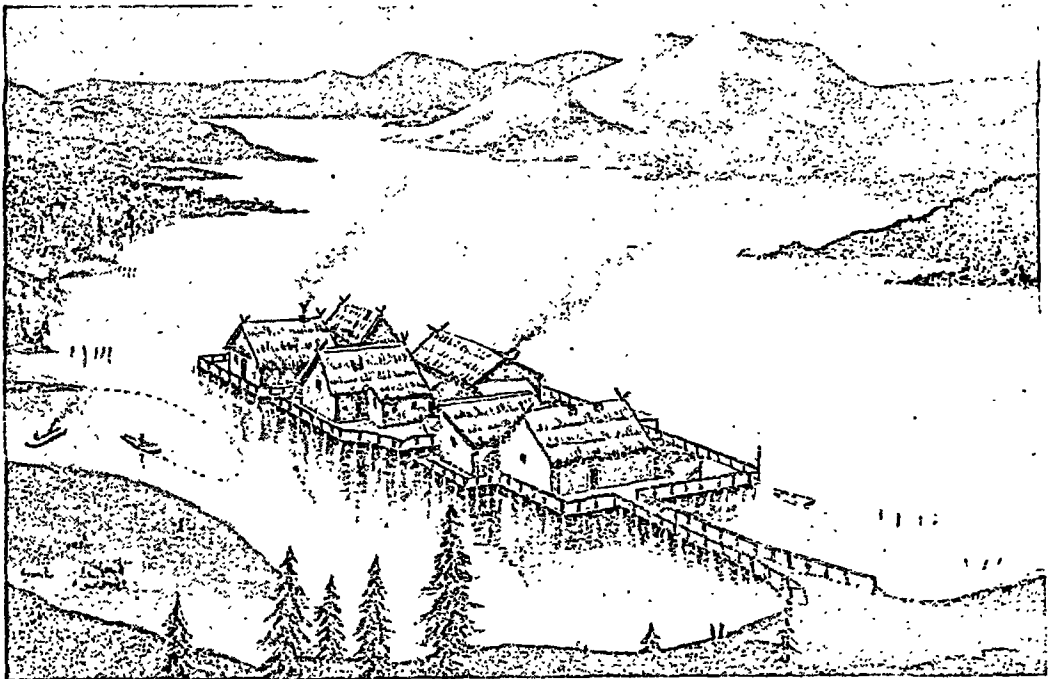
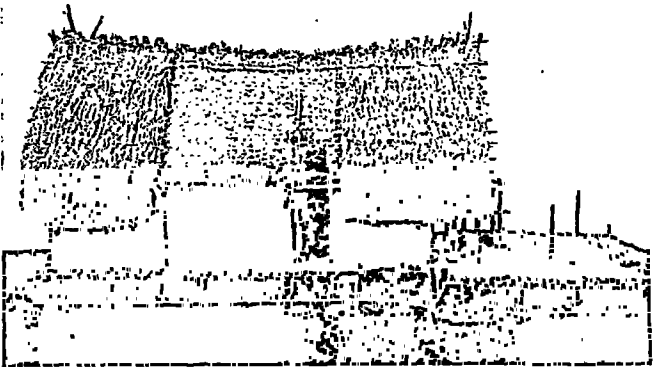
Many of the broad-heads made their way into the mountainous districts of Switzerland, and there (probably through contact with another culture—see Chap. 30) they developed a mode of life worthy of study. For the settlers felled the trees of the forests which fringed the lakes, and, having driven the trunks into the shallow waters as piles, built platforms

on which they set their huts. Thus the lake-villages, of which so many remains have been found, were formed. Farming operations were carried out on the patches of land along the lake-sides; the cattle were driven up to the alpine pastures in summer as they are to-day; but the families, and in time of stress the cattle too, were able to enjoy comparative safety from enemies and from the wild beasts of the woods on their artificial islands, since dug-out boats and easily removable causeways of planks were the only means of access to them.

Of course, the limit of possible population of such places was reached before very long, and there was a certain amount of emigration. Some of these people, for instance, eventually worked their way south into what is now Italy. Here they had left the lake-region but were still on swampy land; and

they perpetuated their old method of life, erecting a modified kind of pile-dwelling known as a *terramara*, in the Po Valley and as far south as Bologna. For these *terremare* and the subsequent Villanova culture see under Chapter 30.

Lake-villages were not, however, an exclusive discovery of the Alpines of the Swiss lakes, for there are ancient descriptions of similar communities in northern Syria and in Georgia. Herodotus, who



VILLAGE OF LAKE DWELLERS IN THE NEW STONE AND BRONZE AGES

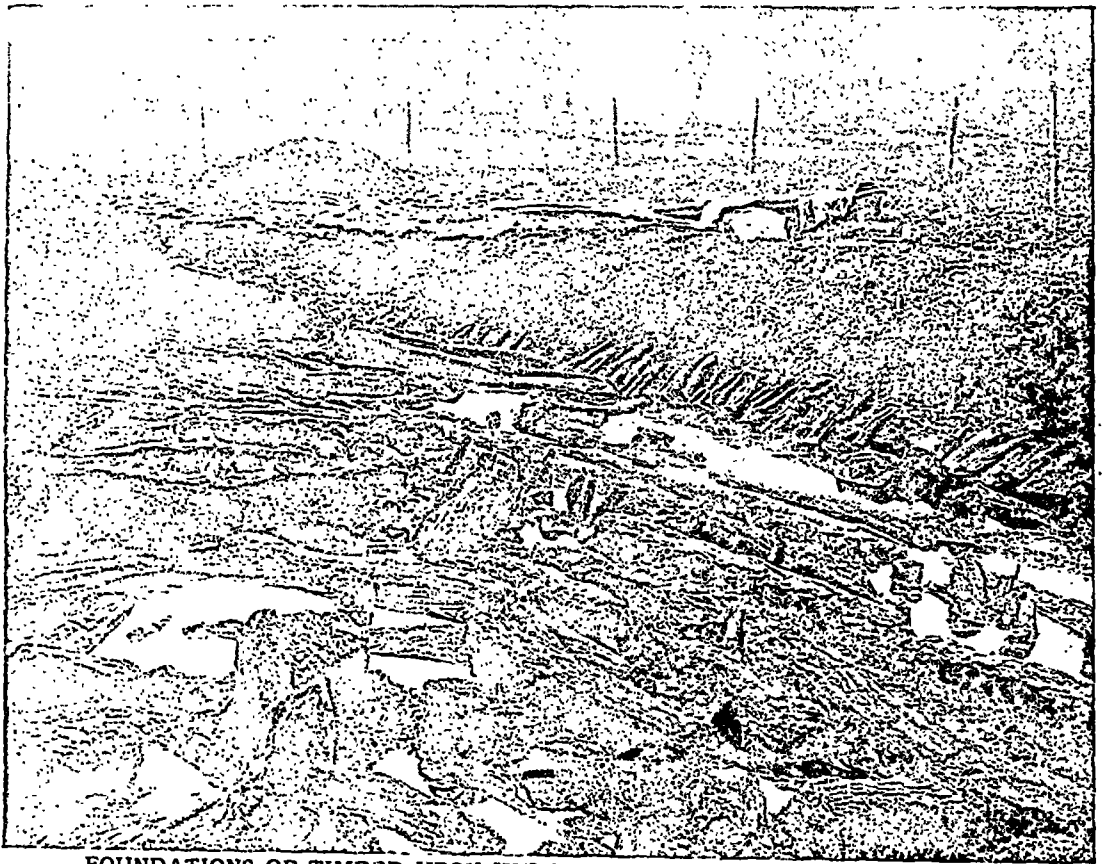
Broad headed newcomers to western Europe developed in the Neolithic Age a new manner of life, which survived into the Age of Iron. They constructed villages on piles over shallow lakes and marshes (see page 267), and connected with the land by wooden causeways, dug-out canoes providing an alternative means of communication. The model above indicates the degree of comfort afforded by such lake-dwellings; the drawing below gives, perhaps, too great an impression of neatness.

Hut reconstruction from Prof. R. R. Schmidt, 'Steinzeitsiedlungen im Federseemoor': drawing after Prof. J. M. Tyler 'New Stone Age' (Scribners)

describes such villages in Macedonia in the fifth century B.C., mentions that the inhabitants fed their horses on fish.

Similar lake-villages occur in distant parts, in the British Isles for example, where there were places such as the village at Meare, near Glastonbury, located in the now drained fens of the stream which flows to the Bristol Channel past Bridgwater, the legendary district of Avalon. This village, which has been most fully examined by Bulleid, existed at least down to the third century A.D., and the details of its civilization are quite well known. Other such villages are to be found in the peat mosses of Scotland, but perhaps one of the most interesting groups of similar communities is that of the crannogs of Ireland, which were inhabited, even used as fortresses, as late as the time of Queen Elizabeth.

The idea that inspired the building of these is the same as that evolved by the builders of the Swiss lake-dwellings; the same, indeed, as was held by the architects responsible for the moated castles and houses and even farms of much later days: 'Live on an island, and if you cannot find an island, make one.' Obviously that can be done either by putting a ring of water round a given piece of land, or by taking your land and setting it in a piece of water. The Normans did the former, the Irish the latter. They drove piles into comparatively solid ground beneath shallow waters, so as to form a circle, and into this they dumped stones and earth and intersecting trunks of trees, thus making a solid platform, not a raised one, as in the Swiss case. Such was the type of the Glastonbury village and of scores of Irish crannogs. Of course, such artificial islets tended gradually to sink,



FOUNDATIONS OF TIMBER UPON WHICH A LAKE-DWELLING WAS RAISED

The remains of a lake-village at Glastonbury, though dating from the Early Iron Age, show the methods used in constructing such dwellings. When the site was first occupied it was covered by a shallow mere, having a peat bottom which afforded an insufficient basis upon which to build. A structure of logs and heavy timber was accordingly laid down, it has an average thickness of three feet, being bounded on two sides by a neat palisade, part of which is here seen.

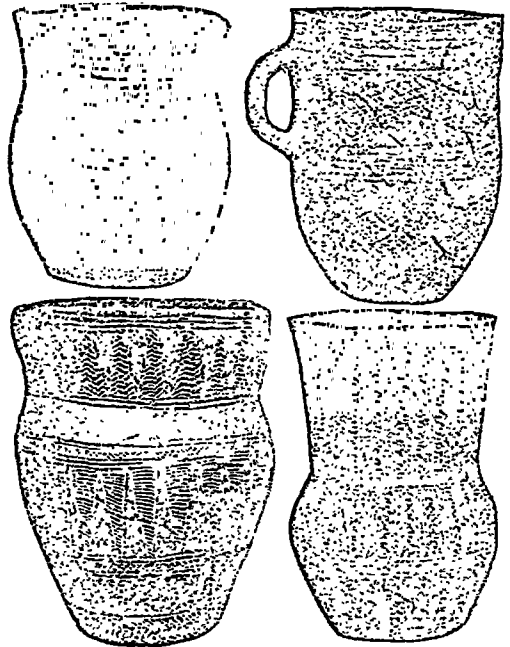
From A. Bulleid, The Glastonbury Lake Village

but that could be rectified by additions of earth. We know, from the superimposed hearths, that this was done on many occasions in the Glastonbury village.

There were, at least associated with this Alpine race, some other groups of whom mention must now be made; and first of all of what are now called the Beaker folk. Suddenly, it would appear, there arose in Spain a people skilled in making a form of pottery coeval with the megalithic industry, but late in this era; the impulse to make it seems to have come from some new stimulus, which was, perhaps, North African. The bell-beaker was a kind of wide-mouthed vessel, ornamented usually with geometrical devices, and was made and used by a people who seem to have highly developed the art of archery and who overran the Iberian peninsula to the Mediterranean area and even as far as Sardinia and Sicily. Moreover, they crossed the Pyrenees and covered almost the whole of France as far north as Brittany. To England also they passed, and the region beyond the Netherlands.

This was not a mere case of traffic in a special type of vessel, for the beakers are made in different areas of the local clay; it was the sign of an invasion (or invasions) of peoples bringing with them their own idea as to the kind of vessel that should be made. In the Swiss district the old lake-village civilizations resisted their onslaught, and they turned into Bohemia and Moravia. From this region now emerged a new type, associated certainly with the last and in the main following the same industries; it is even held by some writers to be identical.

Like the Beaker folk, these men were broad headed and high headed too, and had heavy brows. They buried their dead in cists of stone, which they covered with mounds of earth. The Neolithic people of Britain had done this too, but their mounds were oyal, often ringed with standing stones. The barrows of the newcomers were round, not long, and hence the men who made them came to be called the 'Round Barrow Race.' They became too numerous for their place of origin in Bohemia and moved perhaps eastward at first, but mostly to the north-west, to



WIDELY USED TYPE OF UTENSIL

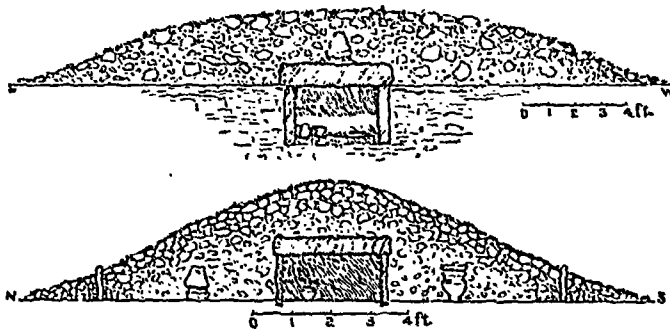
Signs of a new culture, beakers such as these are found in graves throughout the greater part of Europe. They seem to have served as food-vessels and are wide-mouthed, of thin, tough ware usually ornamented with geometric designs.

British Museum

Denmark and Scandinavia, marking their progress by their barrows. Covering the countries they passed through, they reached the sea at the Elbe, Weser and Rhine, and crossed it to Britain on its eastern coasts from Forth to Thames, expelling the 'long barrow' folk to the central forests but letting alone the more civilized megalith builders of the south.

They are, thinks Myres, whose description I have been following, 'the ancestors of the John Bull type of Englishman and the kindred continental stocks.' Some think that these people introduced the Goidelic tongue into Britain, but this theory is opposed to the balance of opinion. They had narrower heads than the true Alpines; they were taller and more robust and their occiputs were not flattened. Perhaps they were a cross between the true Alpines and the Nordics.

A word must now be said about these Nordics. They seem to have come from the Russian steppes, and were horsemen and cattle drivers. They had long heads, fair hair and blue eyes—in contrast to the



ROUND BARROW TOMBS SEEN IN SECTION

A widespread type of grave in the Bronze Age, round barrows were built of heaped earth and rubbish. Many, like the Northumbrian examples seen above, contain receptacles of stone in which the body was placed; and the depositing in them of pottery seems to have been a universal practice.

British Museum

brunette Alpines. Largely for political reasons we have heard a good deal about these Nordics, whom Dixon has described as a blend of Caspian, Mediterranean and proto-Negroid races. In fact the effort has been made in some quarters to show that the Nordic is the only race of real excellence. This is pure nonsense, and due to the fact, as Peake says, that the Nordic 'is strong, robust and courageous, and possesses certain manly qualities which are much admired; also he has taken care for some thousands of years to impress upon his neighbours that these are admirable qualities.'

These people lived in the northern plain, with the Tripolje culture, of which nothing more can be said here, intervening between them and the Alpines, in the district of the Dnieper, south of Kiev. The Round Barrow folk, if they be not the same people as the Beaker folk, are believed to have been crosses between these Nordics and the Beaker folk.

Reference should also be made to the people called Prospectors by Professor Fleure and Maritime Armenoids by Professor Elliot Smith. They belong to the broad headed group, like the preceding races, and are believed to have been an early cross between the Mediterraneans and the Anatolians. Their distribution along the coasts of south-western Europe curiously coincides with that of the ancient mines of gold, tin and copper, and therefore of some types of megaliths.

Such was the racial mixture in Europe at the dawn of the Age of Metals. Now,

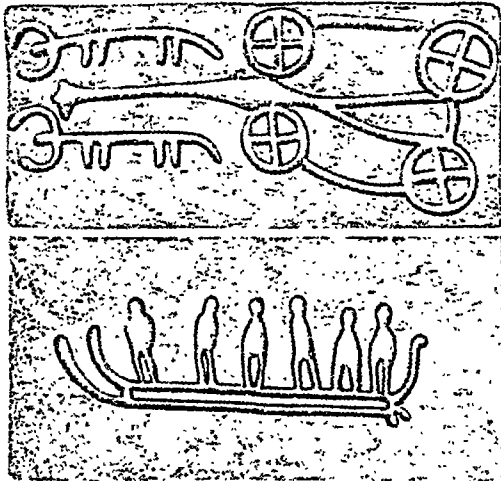
though gold was the first to be used, if only for ornaments and in small quantities, it is to the discovery of copper that the real advance was due. Where, when, and how it was discovered are all much-disputed points. The Egyptian school believes that it was discovered in that land by the accidental fusion of some malachite paint used by the ladies of the period for adorning their countenances. Others think that it was the result of the fusion of a vein of the metal by some hunter's fire.

Pumpelly found it in the lowest of the villages explored by him at Anau, near Askhabad in Turkistan, and attributes the date of that village to 8-7000 B.C.; but that date is probably much too early. Hall brought from Tell el-Obeid lions made of copper dated by him 3200-3000 B.C. (see page 520), and it is obvious from the specimens that the working of the metal had been going on for a long time. It seems probable, in fact, that the knowledge of the metal had existed in Asia at least as early as 4500 B.C., and perhaps even five hundred years earlier; that it was there that the discovery was made; that it was brought from Asia to Egypt in about 4241 B.C. (for the significance of this date see page 422); but that it did not reach Europe perhaps until many centuries after that.

For a time copper was used unalloyed, though there is no evidence for anything like a universal Copper Age.

It was too soft to be used for much except ornamental purposes, but weapons were nevertheless cast from it.

Stone was still the staple, and the period in which both were used is called the Chalcolithic Era. There are evidences of such an era in Spain and in Ireland—perhaps elsewhere. But cassiterite, a salt of tin, occurs in some instances with copper, and it was found that a mixture of the two made a hard metal really useful for implements and weapons. Gradually the classical blend of ten per cent. of tin became the standard bronze. This was the real start of the metal age.



BRONZE AGE CHARIOT AND BOAT

The material civilization of Sweden during this period is admirably illustrated in rock carvings in Bohuslan. Here we see an elaborate, four-wheeled chariot and a beaked ship similar in general plan to those later used by the Vikings.

From Montelius, *Les Temps Préhistoriques en Suède*

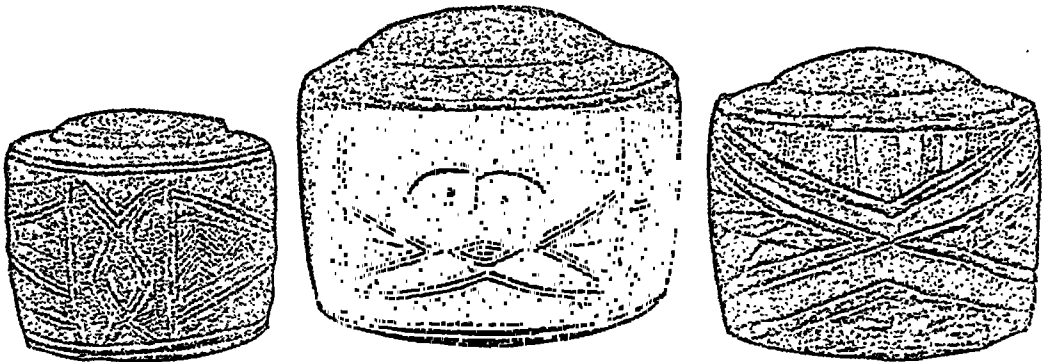
Where the discovery was first made is unknown. Sayce found, in the celebrated royal library of Ashur, an inscription of the reign of Sargon of Agade, c. 2800 B.C., in which the 'tin-land . . . beyond the upper sea,' i.e. the Mediterranean, is mentioned. People were interested in tin, then, at that period; and it is difficult to see why, save for the making of bronze. The earliest bit of bronze in existence is said to be one found at Medum in Egypt and dated to 3000 B.C., though it may be 1,000 years later. There is a claim made that it was

known in China as early as 4000 B.C., but the existing evidence is not convincing. It was found in the second city of Hissarlik, where it would be made not later than 2000 B.C. In Crete it was known earlier even than in Egypt, since it had already appeared during the Early Minoan series of civilizations.

Wherever it was discovered, it spread all over Europe, and with it came a higher culture, for the plough drawn by cattle superseded the earlier hoe, as we see from rock carvings of the period. Men also built boats instead of dug-outs, and, judging from the carvings in Bohuslan in Sweden, these were capable of accommodating as many as thirty people. Salt was mined, as at Hallstatt in the Salzkammergut, where later there arose during the Early Iron Age a great culture known as the Hallstattian, described in Chapter 30. This late bronze culture, with its remarkable art, can, therefore, only be mentioned here, for it really belongs to the next great epoch, that of iron, which, in its later development of steel, is that in which we ourselves are living.

Thus from rude stone implements, through those of superior character, polished and hafted, we arrive at the use of metal which transformed civilization, made its spread enormously more rapid, and for better or worse created the environment in which we exist to-day.

It might be expected that something should be said about a topic more fashion-



ELABORATE AND EFFECTIVE CARVINGS IN CHALK FROM YORKSHIRE

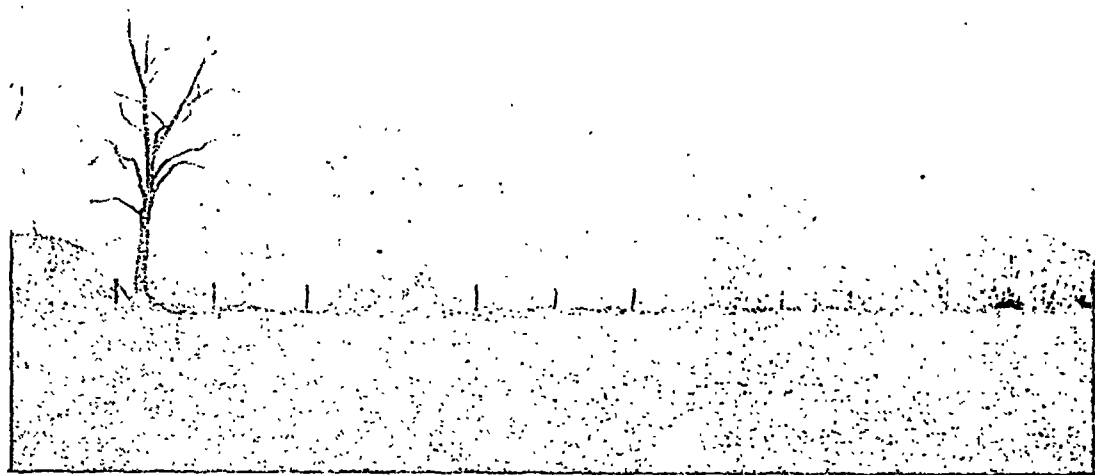
Unimaginative designs executed with considerable technical skill distinguish these solid drums of chalk which are thought to have been idols or fetishes of the Early Bronze Age. The decorative schemes suggest that British artists were to some extent influenced by the Mycenaean culture, probably by ideas transmitted through Spain. On the central drum is a stylised representation of a human face; similar carvings are found on French monuments (see page 270).

British Museum

able, perhaps, some fifty years ago—what is the connexion between these peoples who have been under discussion and the Aryans? To-day, however, we no longer talk of an 'Aryan race,' a term for which undoubtedly, if unintentionally, Max Müller gets the credit in spite of the fact that he protested that he would as soon speak of a 'dolichocephalic dictionary' as of an 'Aryan race.' The present speakers of the Aryan languages can easily be shown to comprise several races; what we have to consider is a group of tongues, all with common roots and presumably a common origin, which used to be spoken of as

page 448, we may make a surmise as to its geographical conditions, from a consideration of the objects for which the various languages possess words in common.

Obviously these tongues must be derived from a group originally spoken by a more or less restricted community; but the part played in Europe by these 'Aryans' in the narrow (and proper) sense is discussed in Chapter 30. The language which they spoke was flexible and capable of great things, and the speakers, perhaps from inability to learn other languages, perhaps from conceit, seem to have been able to impose it



ARTIFICIAL HILL ERECTED TO PAY RESPECT TO THE DEAD

Its antiquity proved by the Roman road that skirts its base, the huge barrow called Silbury Hill, in Wiltshire, was probably constructed in the Neolithic or in the Early Bronze Age. Although no evidence of a burial within it has been revealed by tentative excavations, it was probably intended to be either a tomb or a cenotaph. It is the largest barrow in England, being 135 feet high and 552 feet across, and is formed throughout of chalk rubble.

Photo, E. H. Roberts

Aryan languages, but are now more commonly called Indo-European (Indo-Germanic is obviously another term for the same group).

As the oldest documents connected with any of these languages that we possess are in Sanskrit, it used to be assumed that the original home of the tongue was in India. But considering that most of the languages are spoken outside that land, there is no reason for maintaining this idea. In fact we do not know where the place of origin of the common base language was, though, as explained in Chapter 14,

on the races—often highly superior to them in material culture—which they conquered. These people, in fact, seem to have been born rulers, and to have assumed control wherever they came. Thus we have a group of kindred tongues spoken by people not necessarily related to one another, and to that group of tongues belong almost all those in use in Europe, together with some in the East. Basque is an exception, so are Finnish and Magyar. But dissimilar as they may seem to casual observers, the others belong to the same group.

THE GODS OF THE TWILIGHT

Man's early Efforts towards an Embodiment
of his Spiritual Needs in a Personal Religion

By STANLEY A. COOK Litt D

Lecturer in Hebrew and Aramaic University of Cambridge, Author of *The Study of Religions*, etc., Joint Editor of the *Cambridge Ancient History*

RELIGION meant more to ancient peoples than it usually does to peoples of the modern world. It comprised all that they felt to be most real and essential, and was an inextricable part of their social and political organization.

Of course religious beliefs and practices decayed or changed from time to time and lost their earlier value, and some very striking vicissitudes can be traced, but the history of religion, viewed as a whole, is marked by the revival, recurrence and persistence of similar fundamental ideas. It is for this reason that religion cannot be regarded as something merely invented or imposed by priests or rulers, it must—to a certain extent—answer primary human needs.

As to the origin of religion contradictory views prevail, but the actual comparison of the world's religions, ancient and modern, reveals a significant resemblance in spite of the differences, and this can be partly explained as due to the similar way in which men tend to react to life, and to find an outlet for their aspirations, an answer to their questionings and comfort in their troubles.

The old Christian Father, S. Augustine (A.D. 354-430), declared that the Christian religion had always existed, long before Christ came and before His followers began to be called Christians. That is to say, he, and others like him, did not regard Christianity as something absolutely new, it had its forerunners. And it must be clearly stated at the outset that the science of religion finds essential resemblances and essential differences among all religions, just as the zoologist finds them among organisms, but that

opinions diverge—and often seriously—concerning the difficult questions that at once arise from this comparison.

Moreover, we must throughout this inquiry use the word 'religion' in a very wide sense, apart from the question whether such and such beliefs and practices are rational or magical, true or superstitious, it is enough that they persist or survive, and evidently had a very real meaning and value for the people who preserved them. Again, we have to include what to us often lies entirely outside religion, but for ancient peoples had as profound a meaning as a man's personal religion has for him to-day.

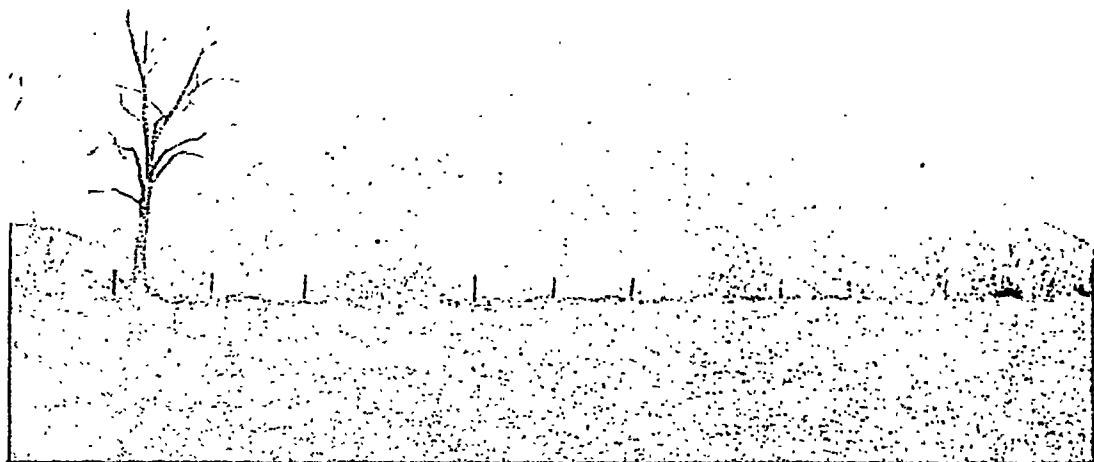
Among ancient peoples, as also among the more primitive folk of modern times, religion held an exceptionally prominent place, partly because they had not reached that stage when religion of mental development coloured all life where there is drawn a distinction, such as we can draw, between religion and ethics, law or science. All the great affairs of their life had what we should call a 'religious' aspect. Their religion was intensely practical, in a sense it was their life. It was shaped by their mode of life and their livelihood, by the nature of their land and its climate. It expressed their temperament and directed their mode of thought.

In fact, ancient religion was not, as a rule, so readily detached from other considerations—'secular' or 'profane' we should call them—as with peoples living at a higher stage of development, and this development, which is a very complicated one, is to be kept in view when we

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Moreover, we must throughout this inquiry use the word 'religion' in a very wide sense, apart from the question whether such and such beliefs and practices are rational or magical, true or superstitious; it is enough that they persist or survive, and evidently had a very real meaning and value for the people who preserved them. Again, we have to include what to us often lies entirely outside religion, but for ancient peoples had as profound a meaning as a man's personal religion has for him to-day.

Among ancient peoples, as also among the more primitive folk of modern times, religion held an exceptionally prominent place; partly because they had not reached that stage where religion of mental development coloured all life where there is drawn a distinction, such as we can draw, between religion and ethics, law or science. All the great affairs of their life had what we should call a 'religious' aspect. Their religion was intensely practical; in a sense it *was* their life. It was shaped by their mode of life and their livelihood, by the nature of their land and its climate. It expressed their temperament and directed their mode of thought.

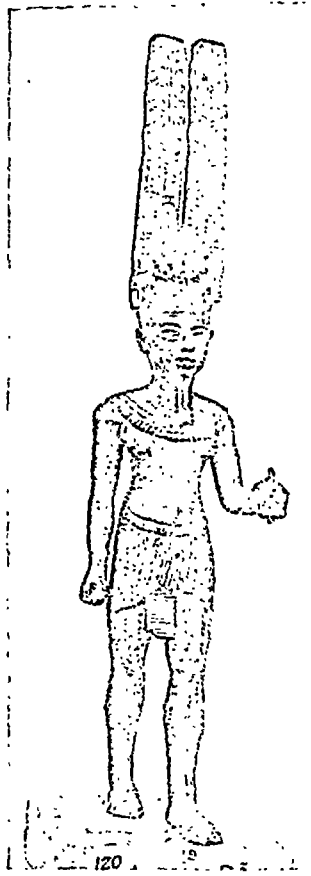
In fact, ancient religion was not, as a rule, so readily detached from other considerations—'secular' or 'profane' we should call them—as with peoples living at a higher stage of development; and this development, which is a very complicated one, is to be kept in view when we

deal with ancient religions, because we learn thereby how we have come to think as we do, and how modern religions have been derived from ancient ones

Our evidence for ancient religion reaches back a very long way. To be sure, we do not get back to the beginnings, and such evidence as we have is incomplete and one-sided; but some 5,000 years ago religion was already well organized, and had characteristic features which may be said to foreshadow more advanced developments even as lower organisms resemble those at a higher stage of evolution.

The oldest direct evidence comes from Egypt and Babylonia, lands which owed both their prosperity and the nature of their religion to the fact that they first consisted of a number of separate towns and city states which depended upon the organization of the water-supply. This co-operation, without which life would have been impossible, encouraged the growth of civilization, and the religions of the two lands had much in common; but, owing to very different geographical conditions, their history was different, Egypt proper (apart from the Delta) being somewhat isolated, whereas Babylonia was exposed on all sides.

In contrast to the marked religious uniformity of Egypt and Babylonia, the old Greek world, with its differences in climate, soil, language and civilization, was distinguished by a no less marked variety and originality. Moreover the Greek peoples—indeed all races of un-mixed Indo-European or Aryan affinity—differed in their temperament from the Oriental, and the difference shows itself in their religion. Again, the religion of ancient India (as it lies before us in the poems of the *Rig-Veda*) and that of



GOD SUPREME IN EGYPT

Originally the local deity at Thebes Amen was eventually identified with the Sun-god, Ra; and as Amen-Ra was sovereign in Egypt.

Photo Mansell

Iran or Persia (in the *Avesta*) were once most intimately connected, but they quickly diverged owing to differences of land, climate and racial temperament. In India, it has been said, the intense heat discourages exertion; it robs men of energy and encourages pessimism and asceticism, so that the outlook upon things is very different from that of Persia, where there is greater variety of climate and life, and the people are more strenuous, practical and adaptable.

Finally, the Semitic temperament differed from that of the Indian on the one side and that of the Egyptian and Greek on the other; and while the three great historic religions are of Semitic origin—Judaism, Christianity and Islam—it is only the second of these that has been shaped by Indo-European genius, and it is no doubt on that account that it has spread through the western world.

At first one is almost overwhelmed by the vast medley of gods, spirits, demons and the rest which abound in the world of religion. But what is fundamental throughout is the prevalence of group, local or regional religion. Of this ancient Egypt and Babylonia furnish most instructive examples. Each district (or 'nome' in Egypt) was properly a separate social, political and religious unit, with its own chief and its own presiding local deity. Between god, ruler and city or land there was the closest triangular relationship; for the god, like the chief, was felt to be more closely related to his own city or land than to any other, and the people expected more from these two than from the gods and chiefs of other districts. For a man to leave his district was to lose the protection of his own god, and a new religion was necessary if he wished to live at peace in a district not his own.

How each district recognized the existence and authority of neighbouring gods is very clearly shown in Chapter 11 of the Book of Judges, when Jephthah recognizes that the Moabite god Chemosh helped Moab as his own god Yahweh helped Israel. When districts were closely allied there was a tendency to perceive that the different local gods were in some way alike, if not akin; and in this way all sorts of interesting developments arose.

On the other hand, when there was war, not only was the army the god's army, but the gods were supposed to participate. The enemies of a district were the enemies of the god, accursed by him; and the gods would go forth to war, often in the shape of images or symbols, so that the loss of these precious objects was tantamount to defeat. The tributaries of a city became the tributaries of the city god, and when treaties were made the gods once more played a part.

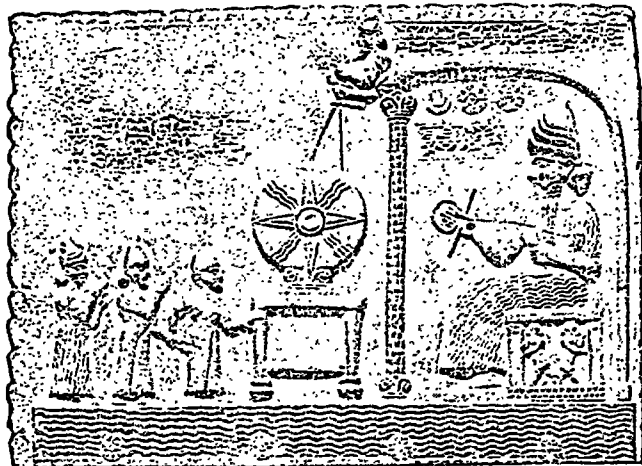
When Mesilim of Kish (before 3000 B.C.) arbitrated between the Sumerian cities of Lagash and Umma and drew up a treaty of delimitation, it was really his own goddess Kadi and the two city gods concerned who were supposed to adjust the boundary. In treaties the most important deities are witnesses; and in the famous treaty concluded in about 1272 B.C. between Rameses II of Egypt and the Hittites relations are re-established between the two supreme gods of the contracting parties, and the subordinate deities on each side bear testimony.

Every war was 'sacred.' There were rites and taboos which were believed to ensure the help of the gods, and essentially served to strengthen the 'moral' of the fighters. And if such 'sacred' wars were therefore more fanatical, religion also served to confirm peace and secure treaties, at least so long as similar religious beliefs were held in common. A league of peoples or nations would be bound

together solely by the common religious beliefs to which each of them adhered.

The gods gave victory and received thank-offerings. Defeat could be ascribed to the superiority of the enemy's gods or to the anger of one's own, and in the latter case steps might be taken to determine the cause and propitiate him. But when through any reason a god acquired a great reputation, pilgrimages would be made to him, rulers and priests would spread his name. Equally the supremacy of ruler and city meant the supremacy of the god.

In this way certain cities gained prestige, and local gods were widely recognized, like Amen of Thebes, Shamash of Sippar or Marduk of Babylon. Neither a supreme chief nor a supreme god could tolerate rivals, and many interesting developments ensued; local chiefs and gods, perhaps, would acknowledge the suzerainty of the supreme ruler and god, and thus the religion became 'centralised.'

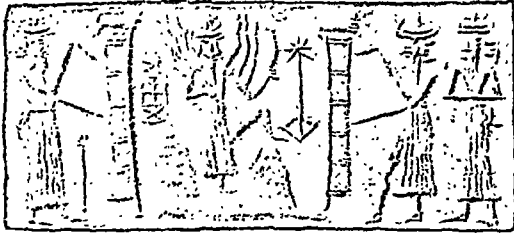


GODS EXALTED BY THEIR PEOPLE'S VICTORIES

Each city state of Mesopotamia had its deity; war was waged in his name, and success glorified him. Above are two such parochial gods who achieved widespread recognition through the prowess of their worshippers: Marduk of Babylon (upper) slaying the monster Tiamat; and Shamash of Sippar.

British Museum

The religious and political unit was now the whole land with its smaller constituent units; and processes of this sort explain why the duties of lesser chiefs and gods, formerly more or less identical, sometimes became specialised, or why the minor sun gods of Babylonia, on the other hand, were identified with Shamash of Sippar when that city held sway. Of course, when the larger unit of organization broke down, as it constantly did, the local units would regain political and religious independence; but the effects of centralisation were not lost, ideas were not the same as before, even as the local chief who had once been part of a great political and



DEIFICATION OF THE SUN

Among nature gods the sun has usually been accorded a high position. On this Babylonian seal we have a religious conception of dawn: the sun god is stepping through the gates of Heaven held open by attendant deities.

British Museum

religious organization would not be quite the same as the local chiefs of old.

Nor is it in ancient religion alone that we may see the usual problem of co-ordinating the larger unit on the one side with the constituent local units on the other. In the 'saints' of Roman Catholic and Moslem lands, in the local 'baals' of Israel and in the earlier local gods of Egypt and Babylonia there have been at work the same general principles of 'group' religion.

It is easy to realize how great would be the difference between a purely local god, one whose habitation and sphere of work were restricted, and a god who was in some way subordinated to a great national deity or was merely a local form of him. Nature gods, for instance, gods of moon, sun, sky and rain, were visible and accessible to all, and therefore were such as could unite the cults of peoples spread over a large area. Unity could also be obtained by definite doctrines concerning the interrelation of the various local gods.

Hence the history of early political development, the extension of power far beyond the immediate neighbourhood of the city state, is also the history of religious development—the recognition of gods who were universal, either as being nature gods or because the ideas concerning their attributes could be shared more or less universally.

Now, at the point where our earliest clear evidence begins all these centrifugal and centripetal tendencies were at work. Many local gods were becoming widely known, there was overlapping of sphere and function, and efforts were in due course being made, particularly by the priests, to reduce the medley of deities into some sort of order.

Though we do not know how the gods first arose in the minds of men, the main factors in their history can be discerned. It is not enough for us to classify gods, spirits, demons and so on into good, harmful or neutral, for the beneficent spirits of one group may be the dangerous ones of another. What is far more fundamental is, first, the very common experience that men have of what is abnormal, marvellous, mysterious and 'uncanny,' especially when they are taken 'out of' themselves or 'away from' ordinary life and experience.

All the more intense states, and even states induced by dancing, liquor or orgiastic rites, have been commonly interpreted as ex-

periences of a super-
sensuous existence,
and especially, in

Emotion & experience
the sources of religion
certain types of cases, as experiences of the presence or nearness of the gods. That is to say, feeling, emotion and personal experience are the springs of religion, although it is important to note that such religion is not necessarily in itself of any high spiritual, social or intellectual value. On the other hand, it is a very common tendency to attribute to supersensuous agency all that is especially striking: primarily, what is inexplicable, irregular and unexpected, and, later, what is impressive by reason of its regularity and evident permanence. That is to say, either what causes awe, fear or speculation by being unaccountable, or what causes

profounder feelings as the manifestation of some dependable process or agency, serves to evoke, each in turn, a belief in superhuman agencies.

Although religious and social systems are essentially one, so that the religious or mystical elements seem to preponderate in the life of ancient peoples, there is much, even among rudimentary peoples to-day, that is performed in a purely 'common-sense' or 'secular' way. But religion enters especially into the difficult or critical occasions of life, to ensure success, to ward off danger or to give emotional relief. Thus we can distinguish between the practices which were intended to produce certain ends, for instance agricultural rites, and the emotional attitude (faith, conviction) which supported men even in case of disappointment or failure, such as lack of rain or loss of crops.

But we have also to notice those practices which we should consider irrelevant or impossible (for example, those believed to bring rain), and must distinguish between those which for their real emotional and social value may be called 'magico-religious,' and could have a certain temporary psychological value, and those which were purely magical and whose efficacy appears to lie in the mere



DEITY FASHIONING A MAN

An index to the important functions attributed to the Egyptian animal-headed gods is afforded by this scene. Khnum shapes a man on a potter's wheel, while Thoth determines the years of his life on a notched palm-branch.

From Guide to Egyptian Collections, British Museum

ceremony itself. So, too, there were practices in order to persuade the gods to grant requests; but while some had a distinctly emotional or social value, others were too mechanical for us to consider them of any religious significance.

Hence, quite apart from the ultimate problem of what a Supreme Power in the universe does for Man, we may say that progress in religion has been due to two factors: experiences that were emotionally valuable for the individual as a member of his group, and ideas which ultimately led to the growth of positive knowledge bridging the gap between primitive prehistoric man and the present day. Now, while the belief in a spirit world is due partly to

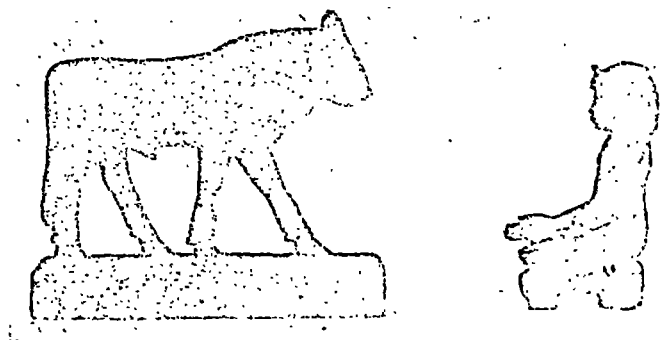
certain experiences, and partly to the desire to find causes and explanations, there existed, as distinct from the gods who were merely gods of *causation* (givers of disease, rain, growth, victory), a belief in those who—like local gods or deified ancestors—stood in close *personal relationship* with men. Indeed, if it were not for the desire to explain things, and for the actual *personal* experience of some supersensuous power, religion would be an absolutely incomprehensible phenomenon.



DEVELOPMENT OF ANIMAL WORSHIP

However idealised their natures latterly became, the theriomorphic deities of Egypt were originally the objects of animal worship, perhaps totems. Thus Thoth (left), here represented as the measurer of celestial seasons, was primarily the divine ibis; and Anubis, god of the twilight, the divine jackal.

Photos, left, British Museum; right, Cairo Museum



QUALITIES SYMBOLISED BY ANIMAL WORSHIP

Since the ancients could not adequately express certain abstractions, they were accustomed to realize them in animal form; thus, a bull first symbolised superhuman strength and virility, then became a deity with these attributes. Here we see the Egyptian bull Apis worshipped by a Pharaoh.

Photo, W. F. Mansell

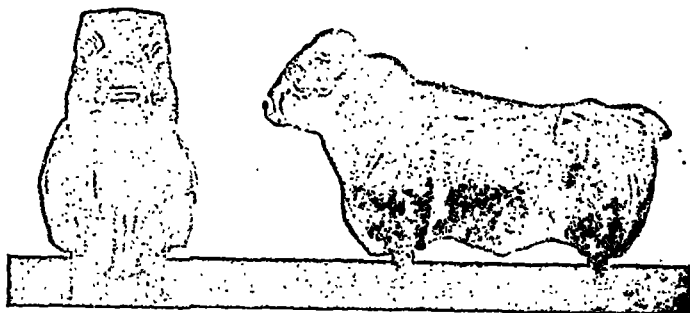
Gods of the second of these two classes were 'personal' gods, whether they were, as in some cases, deified men, or whether, as in early Egypt, they had animal forms like the ibis Thoth, the jackal Anubis and the ram Khnum. This raises important questions. At an early stage of development the difference between human and animal is no more felt than when a household pet or a teddy-bear is treated among us in a semi-personal way. Among primitive peoples there are animal and bird 'totems' which may be said to stand in a personal relationship to the 'totem group.' The members of a totem group claim to be of the same nature as their totem: totemism turns upon this. The totem helps and is beneficial in various ways; and animals in general are often regarded as helpful or effective, their specific ability (strength, fleetness and so on) seeming to be far superior to men's.

Gods in animal form ('theriomorphism') were thus supposed to feel and act more or less like human beings ('anthropopathism'); and, although gods in human form ('anthropomorphism') were more usual, animal symbolism was common in Egypt and Babylon, the bull with its strength and virility being especially well known in the ancient Near East. In im-

passioned language the god was a bull; the lion and ewe were also similarly used as symbols in Babylonia. Just as with us the lamb, fox, dove and serpent furnish the most appropriate images of innocence, cunning and so forth, so in ancient religion anthropomorphic imagery often failed to furnish an adequate symbol for godhead.

Even at relatively high stages of civilization ideas of deity are often felt to be too imperfectly expressed in terms of human personality, while, at the lowest stages, the knowledge of personality is so slight and the theriomorphism so complete that the stage of anthropopathism can hardly be said to be reached. This, for example, seems to have been the case in primitive Egypt; and it is very noteworthy that even in the Greek age, in the days of the decline of this ancient semi-African civilization, animal cults were prominent.

The general movement in religion has been by no means a continuous one. It has consisted in the increasing knowledge of human nature, and this has come through individuals who by their character and activities have left their mark upon the contemporary religion. Looking back, we see man learning to know his nature, his possibilities and his limitations. In his dreams he visited remote places and saw the distant or the dead. He sought



BABYLONIAN RITUAL IMAGE OF A BULL

As in Egypt, animals that originally symbolised ideal qualities were objects of worship in Mesopotamia. This very beautiful and vigorous carving in stone of the divine bull has, as pointed out by Sidney Smith, a bore running from the creature's muzzle right through the body.

By permission of the Trustees of the British Museum

to distinguish between the waking individual and what, to judge from dreams, trances, illness and death, was something other, even something evidently independent of death and dissolution. It was the rude beginnings of psychology.

At a more advanced stage the Egyptian, with his 'ka,' 'ba' and 'ikh,' attempted to express the facts as he understood them. By the first he seems to have meant what we might call his 'double,' his self or personality; by the second, an external form which his soul could take after death; while the third refers to a 'glorified'—and apparently bodily—mode of existence after death. Needless to say, it is very difficult to understand at all clearly the psychology of early peoples, the more especially as we are often as much at a loss as they where deeper experiences are concerned.

The scantiness of their positive knowledge prevented them from controlling their fancies and imaginations, and distinguishing between what could be called 'real' and the opposite. And such knowledge as they had was often so much a part of their religion that any attempt to correct and improve upon it was apt to be resented as an attack upon the religious system and therefore as a threat to the stability of the group. Persistent intelligent curiosity for its own sake was rare, and confined to the most practical matters; but it is right to remember that all the great initial steps towards our accumulation of positive knowledge were taken in remote prehistoric times.

The unknown was explained from the known, from the most familiar objects and occurrences. To the Egyptian the



CREATOR AND PATRON OF WISDOM

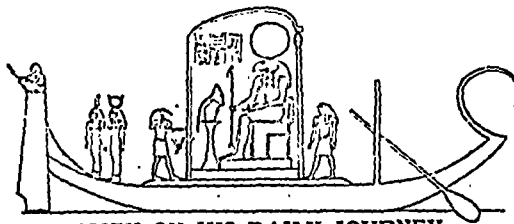
It was believed by the ancient peoples of Mesopotamia that creation depended upon the bidding of deities. Creative power was attributed, for example, to Ea (above), god of the deep waters and ultimate source of all human knowledge.

From De Sarzec Découvertes en Chaldée

sky might be a huge cow with stars suspended from her (see page 362). Why not? The sun god crossed the sky in a Nile boat, a mode of transit as natural in Egypt as the chariot of the sun elsewhere. The flying falcon or the dung-beetle (scarabaeus) rolling its ball of dung suggested the sun in its course. But it would be truer to say that in the minds of those early worshippers these were not *analogies* but *identities*. The beginning of things was due to a potter-god, an egg, or the act of sexual generation. Human and animal growth were not so much analogous as one and the same; and the fructification of the earth found typical expression in the marriage of the Sumerian Ninurta and Bau, the solar deity and the mother goddess.

The supreme importance of sun and rain gods in agricultural communities is manifest; and here fresh questions arise. When the processes of nature—as we should call them—were performed or controlled by gods, everything obviously depended upon the activity of these divine causes or sources of life and growth. So essentially might a god be the origin, essence or cause of natural processes that in Babylonia when the youthful god Tammuz slumbered the flocks slept, when he departed they brought forth no more; and when the great mother goddess Ishtar (the same name as Astarte, Ashtoreth) descended into the lower world to seek Tammuz all procreation and fertility came to an end.

To such powerful deities as these must men appeal when in want, and it is often



AMEN ON HIS DAILY JOURNEY

Explanations of natural phenomena in Egypt seem both fantastic and prosaic. The sun was a god who travelled across the sky—Amen-Ra, here represented with a ram's head, was thus said to sail in his boat along a celestial Nile.

From Breasted, Ancient Egypt

difficult to determine whether they are to be regarded as processes—impersonal forces—which became personified, or as personal powers who were thought to be able to control the processes. In the second case we get a new line of speculation when such gods have the assistance of subordinates who carry out their orders and perform the necessary labours.

Of special interest are such ideas as the creation of the world and the control of vegetation by the 'word' of the god Enlil. Another Babylonian god, Ea, conspicuous for his love of mankind, to whom he imparted all knowledge, similarly uttered his creative 'word.' According to the priestly theology of Memphis, all things were first in the mind of the creator Ptah before he made them. It will be observed that in the growth of self-knowledge it was gradually being realized how much is due to forethought and command. It was a great step when men perceived how reason facilitated action; and from such simple beginnings was ultimately developed the sublime 'Logos' doctrine which we find in the Fourth Gospel.

But men themselves, even primitive men to-day, not only appeal to the appropriate god for a particular purpose, such as rain or sun, or to a god who either has supreme power or who is expected to intercede on Man's behalf; they frequently act as though the natural processes virtually lay in their own power. Everywhere we find early men performing ceremonies supposed to control and utilise the processes of nature. It is as though they were gods! And, whatever we may think of their beliefs and practices, the fact remains that thereby they acquired an incalculable amount of knowledge which would not have been gained otherwise: knowledge which successive ages have tested and purged of the irrelevant. They learnt to observe how things were done, the elementary facts of nature, the habits of animals and birds, and so on.

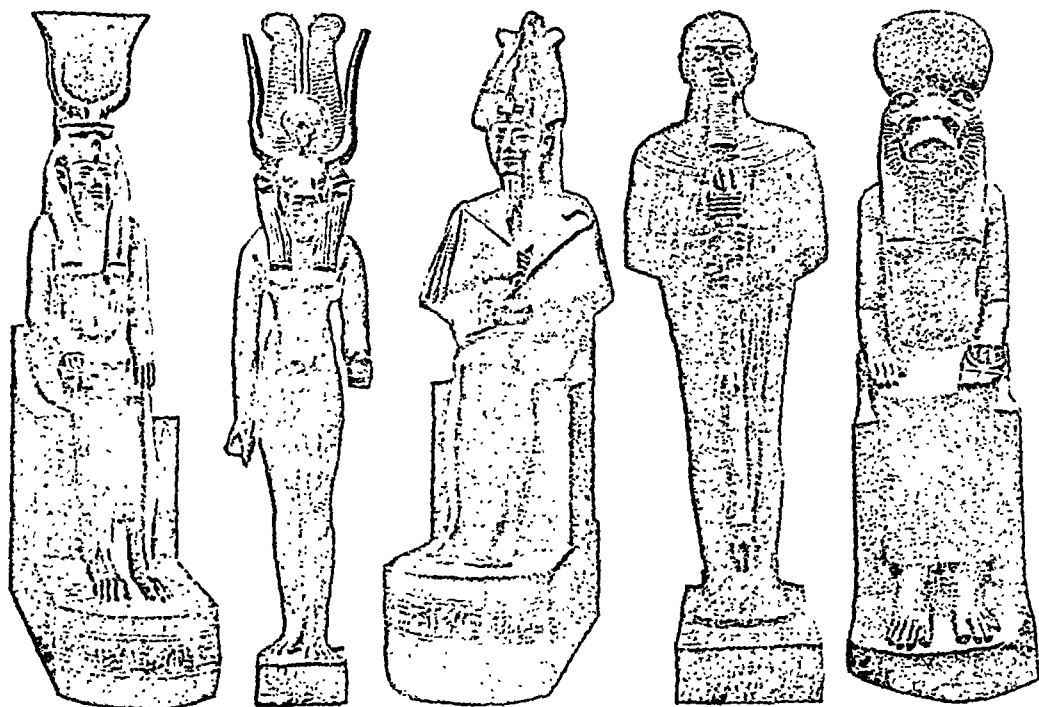
Further, there have always been men who, for some reason or other, have been regarded as especially effective with the gods; indeed, extraordinary powers have been ascribed to them in their own right.

Men of conspicuous personality, or who attracted attention by unusual success, readily gained renown. Now while the gods often came to be regarded as exceptional human beings, though of another sphere, such men were, in a sense, more divine than human, and by reason of their presence and accessibility could be regarded as more influential and authoritative than the unseen spiritual beings themselves.

Here, again, there are manifold developments. Such men were readily established as leaders, and their function became hereditary. Or they became priests whose authority lay essentially in their ability to influence the unseen world. In this way rival authorities emerged, and either rulers—'priestly kings'—sought to control the power of the priests, or priests, as happened during the decline of Egypt in the Twentieth Dynasty, became kings. And besides these there were the more isolated individuals, the magicians appealed to by private individuals, the wonder-workers, and finally the teachers, or prophets ('true' and 'false'), all of them powerful for good or evil.

Outstanding individuals through the powers they possessed, whether directly or indirectly through their relationship to the gods, were more than 'pillars of society' or 'bulwarks of the constitution'; they were *Sacred leaders and* often felt to be, in a *national welfare* very realistic way, responsible for the welfare of the land and people, from success in warfare to agricultural prosperity. The Book of Deuteronomy, especially Chapter 28, has familiarised us with the conviction that obedience to the divine will brings material blessings, whereas disobedience is visited by plague and warfare. But it is very necessary to observe that here the responsibility rests upon the behaviour of the people of Israel as a whole, and not upon that of pre-eminent or authoritative individuals.

It is, in fact, a widespread belief among simple peoples that ethical disorder affects the order of nature; it is as though the laws to which men *should* adhere in order to progress, and those to which nature *does* adhere in the course of a progressive



IMPORTANT GROUP OF DEITIES IN THE EGYPTIAN PANTHEON

Although he had many aspects, Osiris (centre) is best known as the god of the future life, king of the Other World. On the left is Isis, originally a virgin goddess but latterly his wife and the mother of Horus; she is here shown both with a human and with a cow's head, the latter identifying her with the Mother Goddess. On the other side of Osiris are Ptah, the creator-god of Memphis, and Sekhmet, a goddess with the head of a lioness who represented the power of the sun.

Cairo Museum

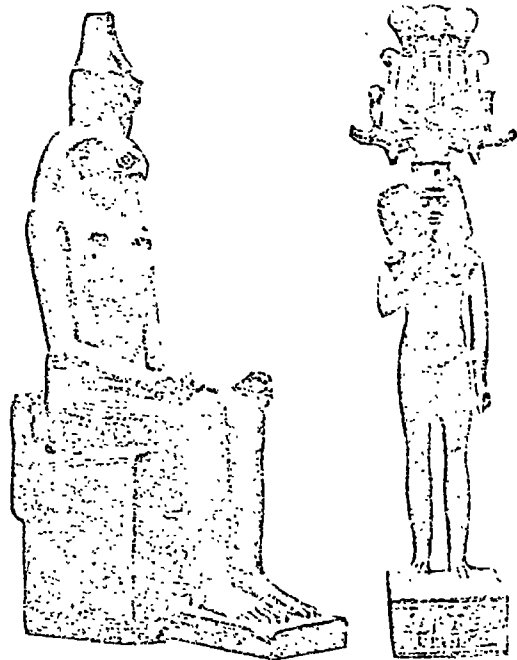
evolution, were one and the same. It is as though the Laws of God and the Laws of Nature were parts of one system. The belief is characteristic of early stages of thought, and has been of fundamental importance in the development of ideas.

Now in early society the group unit had a corporate responsibility: the whole suffered for the wrong-doing of one, or benefited by his good deeds. The group had an interest in promoting what it felt and found to be good for itself, and there was relatively very little individuality. But as a general rule the tendency was for this responsibility to be transferred to special individuals, and so we have the idea of representative men who at first possessed complementary responsibilities and privileges, rights and duties.

It is they alone who stand in a specially close relationship to the unseen world, and a most interesting process in the history of religion is the way in which beliefs and practices at one time associated solely

with these representative individuals were gradually extended to others, not without modification, so that the life and thought of the group as a whole was continually, though not continuously, being raised to a stage that approximated more nearly to the life and thought of the select few.

The institution of the 'sacred man' or the 'divine kingship'—that is, the special sanctity of the chief or ruler—has been instrumental in founding and establishing far-reaching ideas. In Babylonia the god was the lord and king of the city state, and the chief was his representative, the god's vicar on earth. His authority came from the gods, as also his insignia, and all he held was on trust: it has been a peculiarly pregnant belief that both land and people were, properly speaking, the god's. The ruler's name had been proclaimed by the god, or he was predestined from birth, or his election went back to time immemorial—in this way the legitimacy of his position could be



GOD OF THE RISING SUN

Horus is usually represented either as a majestic, hawk-headed god, or as the young son of Isis—a boy who holds one finger to his lips. He was identified with the king and kingly office, and was believed to slay obnoxious creatures.

Cairo Museum

secured. He was the chief priest of the god, the Pharaoh was the 'champion' of Osiris, and similarly elsewhere the chief priestly offices were commonly held by the king and the royal family.

The king's god was his father, his begetter; the great goddess Isis was the divine mother of the Pharaoh. He was suckled by the goddess, and the Sumerian king Gudea addressed the mother goddess Gatumdag, who had borne him:

I have no mother, thou art my mother;
I have no father, thou art my father.

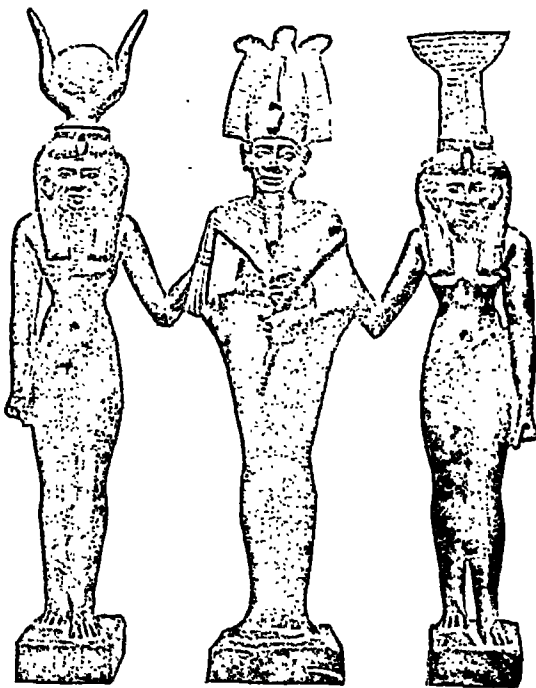
Similarly, Yahweh, as in Chapter 32 of Deuteronomy, could be regarded as both father and mother. The passages illustrate the desire to describe the relationship between a man and his god as closely and completely as possible; and Egypt is remarkable for the extraordinarily realistic way in which it depicted the dogma that the Pharaoh was the visible god, begotten by the god, and the divine begetter of his wife's children.

In Egypt it is expressively said of Rameses II (see Chronicle II): 'Egypt has been the only daughter of Ra; his

son is he who sits upon the throne of Shu.' And in virtue of such relationship the gods Horus and Set were 'brothers' of Thothmes III, and Isis and Nephthys were his 'sisters.' Semitic, and notably Biblical, names would describe a god as brother or father (Ahijah, Abijah), even as the Babylonian law-giver Hammurabi was called 'brother' of the god Zamama. Other Babylonian kings were the 'dear consort' of their goddess, even as Israel was the first-born or the spouse of Yahweh.

These realistic ways of expressing intimate relationship recur when kinship is claimed with the sun, or, on lower levels, with totem animals; and this kinship becomes a virtual identity when, in one form or another, men imitate in dress or toilet their god, sacred ancestor, animal or totem. It is a concrete, physical imitation, the forerunner of the more ethical imitation of anthropomorphic gods on the higher levels, when men are bidden to be like unto their Heavenly Father.

The relationship, close and loving—the god 'loves' the king—between the god and the district, or rather the repre-



OSIRIS WITH SISTER DEITIES

When attempts were made to reconcile the deities of different tribes in ancient Egypt, many triads were formed; this group consists of Osiris with the goddesses Isis, his consort (left), and her sister Nebhat (Nephthys).

Cairo Museum

sentative individual, was not one-sided. It is true that in one curious case the goddess Nidaba was held responsible for the sins of Lugal-zaggisi, the priest-king of Umma; but rulers were expected to rule righteously. The king was typically the 'shepherd,' and in Babylonia his symbol of office was the shepherd's crook. Often he was called the sun, or the sun god himself; and as the sun was a symbol of dark-dispelling, all-searching light, so the sun god was god of righteousness and justice.

Hammurabi, for example, in the introduction to his Code of Laws, declares his divinely-appointed mission to put down evil and protect the weak; and in Egypt pharaohs and local chieftains will tell us on the walls of their tombs how they misused no citizen's daughter, oppressed no widow, deprived no man of his field, and so forth. Pepi-nakht of the Sixth Dynasty declares: 'Never did I say anything evil to a powerful one against any people, for I desired that it be well with me in the great god's presence; I gave bread to the hungry and clothing to the naked.' But this did not prevent him from slaying many chiefs' children on an expedition to Nubia! And in the preceding dynasty Henku (who likewise 'fed the hungry and clothed the naked') nourished the sacred animals, oppressed no one and gave no one cause to complain of him before the city god.

But the chief had to do more than rule justly. 'I cultivated grain and loved the harvest god,' says Amenemhet I of the Twelfth Dynasty; and Rameses II is 'lord of food, plentiful in grain, in whose footsteps is the harvest goddess.' His word brings rain, for he is the great



GODDESS SUCKLING KING

The intimacy of the relations supposed to exist between the half-divine Pharaohs and the deities is suggested by this representation of Seti I suckled by Mut, the mother goddess.

From Capart, Temple de Sêti I

national god Ra in human form. The king, in fact, was directly or indirectly responsible for the entire welfare of the land and people. In consequence of Sargon's wrong-doing 'the great god Marduk was angry, and he destroyed his people by famine,' and a contemporary tablet of the privileges of Sippar, Nippur and Babylon tells how the ruler's evil could bring disaster to his house and the people:

If the king does not heed the law, his people will be destroyed, his power will pass away.

If he gives heed to the wicked confusion will set in.

If he gives heed to the counsels of Ea, the great gods will aid him in righteous decrees and decisions.

If he oppress a man of Sippar and perverts justice, Shamash [i.e. the sun god], the judge of heaven and earth, will annul the law in his land, so that there will be neither priest nor judge to render justice.

Now when such convictions prevailed concerning the sweeping powers of great representative individuals, any kind of disaster might be attributed to any defect—physical or moral—in the ruler. Rameses III calls himself an 'abundant Nile,' and the language may strike us as merely picturesque; but there could be a far more realistic meaning in it when the sacred king might be deposed or put to death because of a lack of rain or of other evils for which he was held responsible, or, as readers of *The Golden Bough* will understand, because there was a genuine fear lest any weakness of his, or approaching old age, should impair the success of those natural processes of rain, flood or increase of flocks upon which the fertility of the land and the life of the people depended.

The ruler was an obvious and convenient scapegoat. The official religion centred

round him ; purification and atoning rites were performed for the Babylonian king. He must observe certain fasts, penitential prayers were written for him, and the regal style, describing the deeds of the god and king, initiated a characteristic type of literature. The subordination of the ruler to his god is often found expressed in telling language ; thus Akhnaton (see Chap. 24) is called the 'beloved son' of his sun god (Aton), 'thy child who came forth from thy rays' ; 'thou hearest for him that which is in his heart, and thou doest according to that which comes forth from his mouth.'

Such an intimate relationship, however apt to become a mere convention, could also be genuinely felt, and it gave birth to a variety of beliefs and practices. The ruler's responsibility, as the representative of both god and people, and by reason of the powers attributed to him, was such that he might be sequestered and hedged in by innumerable taboos, in which case the secular power would fall into other hands. Or he himself might exert secular authority and, as we learn in the old Indian Rig-Veda, have his 'purohita' or domestic priest to perform the religious offices.

Again, while it easily happened that conspicuous individuals after death came to be regarded by a later generation as

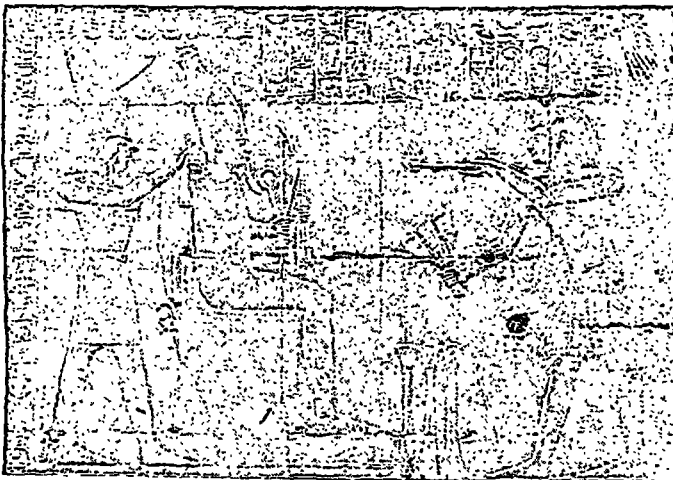
effective gods, the cult of the actually living king prevailed in both Babylonia and Egypt and royal statues were objects of worship. The interpretation of personal names shows how Hammurabi, for instance, could be regarded as 'my god' or 'my sun,' and in the Amarna Letters (about 1400 B.C.) the petty princes of Syria and Palestine address the reigning Pharaoh as 'my sun god' or 'my god.'

Nevertheless, if at one time the representative individual was felt to be a more obvious and concrete god than the unseen powers of which he was the representative, at another, through his personal character or other causes, this too human symbol was repudiated. God was something greater than this creature of flesh and blood ! But these 'individuals,' these divine kings, must have had an immense influence upon the religion of their age.

It was natural to think of the god's abode in terms of the royal palace ; indeed the temple was the palace over again. When Gudea, inspired by a vision, built a new temple, the pattern of which was given to him by his god—as Yahweh gave one to Moses—he transferred thither the pantheon. There was, first, the great god Ningirsu and his wife Bau, with their sons and seven virgin daughters ; but

the list also includes among the gods a water-bearer, captain and chamberlain, a grand vizier and the keeper of the harem, Ensignun who tended the asses and acted as charioteer, the shepherd Enlulim, a musician-god and a flute-player, the guardians of the god's sacred fish-ponds and of his cattle, the building inspector and the supervisor of the machines for irrigation. All these gods and others had their shrines in order to be ready to wait upon the chief god.

Again, there were intermediaries between the great king and the humble individual, and similarly between the great god and the worshipper. And just as the king



PHARAOH DOES HOMAGE TO OSIRIS

Not only was the king of the ancient theocratic state the representative of the god to his people—indeed, in a special sense a god himself—he was also the representative of the people to their god. Seti I, on a bas-relief in his temple at Abydos, is here seen making offering of incense and libations to Osiris.

Photo, Sebahi

had counsellors, so, too, the gods conducted their business. At the Babylonian New Year the god Nebo (Nabu) visited his father Marduk, and they presided over an assembly of the great gods and during eleven days decreed the fates of men and lands for the coming year. It is not improbable that this was the origin of the popular Jewish tradition that the Deity held court the first ten days of the year and inscribed in the book of fate the destiny of men. To this very day the Jewish greeting for the New Year is 'may you be inscribed for a good year,' and at the tenth day, when the book of fate is closed, 'may you be sealed for a good year.'

In general, the tendency in the history of religion has been to think of the gods and their realms in terms of outstanding individuals and mundane affairs, and then to reverse the process and take the convictions and traditions concerning the supersensuous realm as patterns, exemplars and starting-points for mundane life and speculation. These two processes can be traced everywhere; they are fundamental in the development of religion.

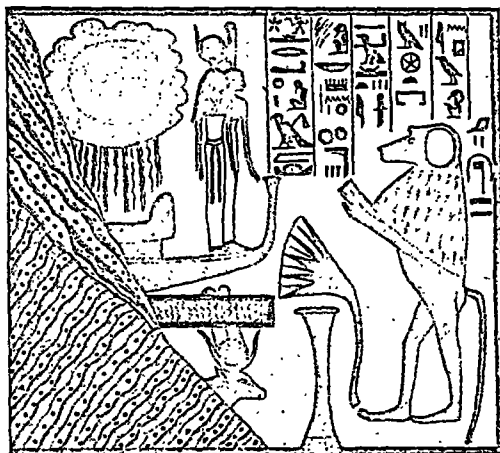
Convictions of an existence other than human, and of life after death, were alike shaped by common experience; but in the first instance they arose from universal experiences which compelled men to speak of an 'other' and a 'beyond.' But men's ideas of death differed widely. Thus in Babylonia there was a dark forlorn realm, the 'land of no return,' whither

Different views even the kings departed.

on after-life The Egyptian, on the other hand, indulged in

riotous speculation concerning the after-life, resulting in most hopeless confusion. What is at least clear is that to an Egyptian the other life was a replica of this, and that by means of prayers, charms and models of slaves and household objects provision was made on behalf of the deceased for his very human life in the tomb and for the satisfaction even of his most elementary needs.

Among many peoples death is something anomalous: man might have escaped mortality. A Babylonian myth tells how Adapa lost the chance of securing immortality for mankind; the Babylonian



SOUL PASSES INTO THE WEST

The final stage of the journey made by the soul of a dead king, according to one Egyptian cult, was accomplished at nightfall, when it passed into the Mountain of the West, bound for the Other World, on the boat of the sun god, Ra.

Noah (Uta-napishtim—see page 588) alone passed to the land of the gods. Only the gods live, yet even they have their vicissitudes; and, no longer worshipped, are ignored and die, or lose rank and become mere demons, as was the fate of some of the great gods of old. The death and rebirth of the gods of vegetation, and the rites associated with the Babylonian Tammuz, did not arouse or strengthen a belief in the resurrection of individuals, as it did later in the more private and mystic rites of Attis. But men have usually gone to work as though earthly existence was not the sum-total of all life; only when they began to reflect upon human destiny did haunting doubts arise.

Men of outstanding personality linger in memory, and can hardly be regarded as dead, while the death of those to whom are attributed far-reaching powers (such as control of the weather) is a catastrophe, bringing a problem to be solved. How could the land continue without its all-powerful representative? Continuity—both political and cosmic—was secured by the dynastic idea in Egypt, in that every Pharaoh was the divine son of the eternal and self-begotten Ra. But as early as the old Pyramid Texts (Fifth Dynasty) there is passionate insistence that the dead king is alive: it is a protest, so to say, against death itself.

Even for the divine king the journey to the home of the dead in the West was not an easy one. He is spoken of as the rain (which when alive he would be expected to control); he is a cosmic power like the sun god; he joins the sun and mingles with it, or, as was said later, 'the divine limbs are mingled with him that begat him.' He is identified with Osiris, the god (perhaps originally a deified king) who had died and was resurrected. But he has also an individuality of his own and he must make the journey as best he can.

There are remarkable spells and magical practices to facilitate the passage, to threaten or weaken gods and others who might stand in his way;

Perilous passage to the other world the ferryman must be cajoled—the king is a pygmy who must be ferried across to dance before Ra and amuse him as dwarfs and pygmies danced at the king's court! We may compare the clown sent by the Babylonian god Ea to amuse the queen of the Lower World so that she might release the goddess Ishtar. Ethical ideas, however, were not wanting, even as the god Osiris himself had to be vindicated or 'justified' before he gained his place in heaven. Indeed ethical requirements, though not prominent, can be traced throughout.

The ideas concentrated upon the Pharaoh were, at a later stage of social development in the Middle Kingdom, transferred to the nobles and officials. Ultimately the destiny of Osiris and his victory over death could be shared by all; but it is noteworthy that charms and amulets were indispensable, and a scarab laid on the breast of the deceased enjoined the heart not to testify against him at the judgement—a magical means of quieting the voice of conscience!

As a matter of fact, Egyptian ideas concerning the gods, death and the dead are too complicated and confused to admit of any simple statement. Righteous behaviour, the help of a saving god, and—what required neither works nor faith—readily obtainable 'passports': this triple road to the next world is not unique. That the dead could assist the living is obvious from necromantic and other practices; and as early as the Fifth

Dynasty a priestly judge proclaims on his tomb his life of rectitude, and undertakes to commend to 'the god' all who offer him food, clothing and ointment.

But immortality was also won by ensuring the immortality of one's name. The name and what it denotes were one in early thought; and to know the name of a god was a sign of intimacy, so that by learning the secret name of her father, Ra, the goddess Isis was able to acquire and use his powers. The victorious Sumerian king Eannatum boasts that the god Ningirsu had uttered his name: it was a token of friendship and a guarantee of assistance. Statues and temples were erected with appropriate names believed to preserve the life of him named thereon, and it was a pious duty to restore the obliterated names of ancestors or perpetuate them on a new monument. In this way the name of the dead was made to 'live,' whereas the name of an enemy would be mutilated or destroyed. Senusret I declared, 'the king dies not who is mentioned by reason of his achievements,' and Seti I made a well in the desert 'so that grateful travellers will thank God in my name, in after years.'

But the hope of ensuring that one's memory remained green could suggest less useful achievements; and while the desire to construct a permanent monument to one's name may partly explain the erection of gigantic pyramids, a grimmer rite—though **Prisoners slain that the pyramids must have Kings might live** meant much misery and loss of life—and one bound up with certain obscure ideas of blood and of the supersensuous realm, was the slaying of prisoners to the god by kings like Amenhotep II and Rameses II that they themselves might live for ever.

As religion was behaviour rather than doctrine, and as human society and what we call 'nature' were not clearly distinguished, ethical and ritual ceremonial offences—offences against men, the gods and the effective supersensuous powers—were equally dangerous, and brought their punishment. In Babylonia, as elsewhere, all bodily ills and misfortunes were the work of gods or demons, and we find amid incantations and prayers a list of

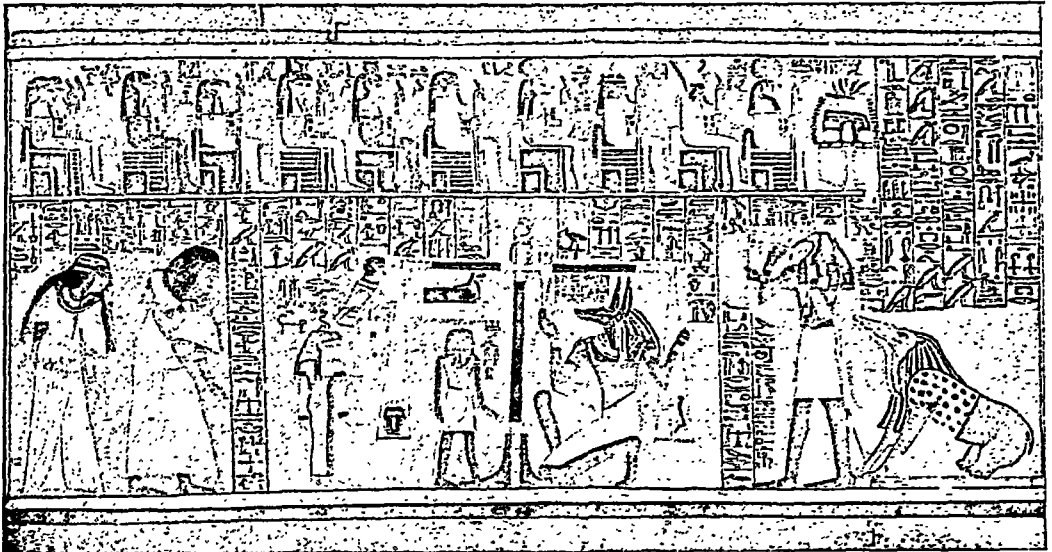
possible offences of which the sufferer might have been guilty.

The list is in the form of a series of questions: Has he estranged members of the family—they are mentioned in detail—from one another? Has he neglected parents or insulted an elder sister? Has he not released a prisoner? For 'No' said 'Yes,' for 'Yes' said 'No'? The list includes the use of false weights, the removal of a boundary, seizing a neighbour's house, shedding his blood, stealing his garment. Was his mouth frank, but his heart false? Was it 'yes' with his mouth, but 'no' with his heart? Has he taught what was impure, instructed in what was not proper? Did he follow the path of evil? Did he overstep the bounds of what was just?

Ritual error finds a place: Is it a sin against a god, a transgression against a goddess? Has he offended a god, neglected a goddess? Did he withhold an offering he was bound to make, enraging his god and his goddess? Did he rise up in an assembly and utter mischief? And at the end of the list comes the more 'magical' command: 'Loosed be all wherewith he is banned!'

Corresponding to what we may call the Interrogative Confession of Babylonia is the so-called Negative Confession of Egypt in the Book of the Dead, where the deceased is tried before Osiris, protesting his innocence, and his heart is weighed in a balance with the ostrich feather, the symbol of Maat, the goddess of Truth and Right. He states his integrity in the form of a series of negatives: I did not slay men, I did not rob, I did not steal, I did not stir up strife, I did not speak lies, I allowed no one to oppress the weak, I did not diminish the food in the temples or the offerings of the gods. The list is made up to forty-two statements, to correspond with the forty-two associate judges of the forty-two nomes of Egypt, and includes loud-speaking, eavesdropping, avarice, adultery, depriving children of milk, catching the birds and fish of the gods, reviling the king, blaspheming the gods.

Moral requirements in themselves were nowhere rare, for in every social-religious group care is taken to maintain what is felt or thought to be for the preservation of the solidarity of the group and to defend it against rival or hostile groups.



DAY OF JUDGEMENT AS CONCEIVED BY THE EGYPTIANS

Having successfully escaped the many dangers of the journey westwards, the soul had one dread ordeal before it. The 'Negative Confession' had to be made to Osiris—a proclamation that the dead man's life had been not necessarily virtuous, but without vice. His heart, as this Eighteenth Dynasty illustration shows, was weighed by Anubis in the balance against Truth; if it failed to pass the test it was devoured by Ammit, the horrible monster on the right.

From the Papyrus of Ani, British Museum

But we meet with no real penitence or reparation, and the lists include all that is considered reprehensible, mainly in order to ward off likely untoward consequences.

Egypt stands out above other ancient lands by reason of the way in which conduct during life was expected to affect the future life. In Babylonia we find an emphasis upon the offences of which a man may have been *unconsciously* guilty—

an idea that naturally encouraged resort to charms and magic—and there was a more searching analysis

of the subtle evils of falsehood and treachery. In Babylonia, too, the rewards and punishments were for *this* world; as an illustration we may cite from Professor Jastrow's translation of an Assyrian copy (seventh century B.C.) of what was presumably an old Babylonian text:

Thou shalt not slander—speak what is pure!

Thou shalt not speak evil—speak kindly!
He who slanders and speaks evil, Shamash [god of justice] will visit recompense on his head.

When thou art angry, do not speak at once.

If thou speakest in anger, thou wilt repent afterwards,

And in silence sadden thy mind.

Daily approach thy god

With offering and prayer as an excellent incense!

Before thy god come with a pure heart,
For that is proper towards the deity!

Prayer, petition and prostration

Early in the morning shalt thou render him;

And with god's help thou shalt prosper.

In thy wisdom learn from the tablet [on which this is written].

The fear of god begets favour,

Offering enriches life,

And prayer brings forgiveness of sins . . .

It was the height of wisdom to be godly and humane; and Egyptian literature affords illustrations comparable to the above. The idea of social justice was so far developed that there was on record the case of Kheti the vizier of Memphis, who, in his anxiety to be just, 'discriminated against some of the people of his own kin in favour of strangers lest it should be said of him that he favoured his kin dishonestly; and when one of them appealed against the judgement he persisted in his discrimination.' 'Now

that,' says the old papyrus acutely, 'is more than justice.' And it tenders this advice: 'Look upon him who is known to thee like him who is unknown to thee; and him who is near the king like him who is far off.'

These excerpts are from the traditional Installation of the Vizier, dating back probably to the Middle Kingdom. It is an extraordinarily interesting document from an age when, as in certain other ages known to history, fundamental ideas of right and justice were being re-examined. Along with it we have examples of more pessimistic literature, the most notable of which is the Story of the Eloquent Peasant. Here the central note is that justice is to be looked for in the ruling class; it is expected of them that they deliberate justly:

Speak not falsehood, for thou art the balances; lo, thou art at one with the balances; if they tip falsely thou tippest falsely . . . thy tongue is the index of the balances, thy heart is the weight, thy two lips are the beam.

The ordinary individual had little share either in the official religion or in the government. As Hammurabi's code shows, the particular ideas of right and justice were everywhere those of the age, and a distinction was hardly drawn between Right and what we call 'rights,' between Justice and what we should call our 'dues.' What we call 'abstract' ideas were grasped only in concrete and material examples of them.

The code affords striking illustrations of ancient class law, with, as is typical, fewer rights and less heavy

penalties where the poorer classes are involved, either as victims

or offenders; while the slave is almost without any rights. It was left for Hebrew prophets of later centuries, like Jeremiah and Ezekiel, and for Jesus, to preach true individualism, the supreme significance and sacredness of each and every individual, his personal rights and privileges, together with his personal duties and responsibilities (so often forgotten in course of time), even though, as in the Parable of the Talents, his endowments are relatively small.

Strictly speaking, every individual who was a full member of the social group was governed primarily by those two complementary and reciprocal requirements. He had duties to the gods and to the group as a whole; and among many peoples severe initiation rites impress upon him the privileges of being one of the group. At the same time, as already mentioned, the gods and the group protected his interests. Yet everywhere, from one cause or another, the group with its self-supporting system of reciprocal ideas would tend to collapse, and the religious aspect of the disintegration and fresh integration of tribal, local or national communities is one of extreme importance.

It was commonly through social and political causes that the social-religious unity would be broken up. Socially, with responsible ruling classes on the one side there grew up on the other those who were ready enough to avoid irksome responsibilities, but none the less looked for support and protection and willingly or unwittingly became increasingly subordinate. And in like manner, as the religious system broke up, there appeared religious or priestly classes on the one side, and on the other those who were content to leave to them the religious duties and obligations, often with irksome taboos and severe preliminary training, but who nevertheless expected the gods to protect all alike.

The history of specialisation in social, economic and religious development enables us to see that the great changes in history have been influenced, when not initiated, by movements which now unified and now disintegrated ideas, and that the group-unit, which is so fundamental in human history, can be regarded as a system of common feelings, aspirations and ideas which is always affecting and being affected by other contiguous systems. The subject is a new one, and all that is necessary for us here is to observe how in ancient times religion inevitably entered into all the vicissitudes of social decay and regeneration.

In the Babylonian code religion and law were severed. This was an advance in

the development of thought and in the analysis of law, but it tended to the decay of both religious and legal sanctions. One is tempted to believe that under Hammurabi's code the land was law-ridden, and that the laudable tendency to set down rights and penalties in black and white, and with remarkable fullness considering the age, defeated its object.

Similarly the Sumerian and Egyptian priestly regimes tended to make men priest-ridden, and the well-meant effort to perfect the machinery of the relations between gods and men was as soul-destroying as the legal machinery of a Ham- **Consequences of a sacerdotal regime** murabi. The centralisation of government and religion was always liable to deprive the individual of all those local gods and rulers who formerly had been directly devoted to his interests; and the superior position which local saints (or 'welis' in Palestine) are still apt to hold over the gods of the great national religions, and the growth of local, private and other than national cults, are among its typical consequences.

The part played in later ages by sacred history and tradition and sacred books is elsewhere taken by the myths of the gods—myths so sacred that often they were not to be idly repeated. To the Egyptian the myth of Osiris and his devoted wife Isis and his self-sacrificing son Horus inculcated homely lessons, just as later in India there were presented to all men in the story of Rama, Sita and Lakshmana simple types of filial love, wifely faithfulness and a brother's affection. The psychological value of the old and simple, though often crude and unnatural, myths needs to be borne in mind; for when the enthusiastic Pharaoh Akhnaton spread his rather subtle solar monism and attempted to eradicate ancient names and suppress long-known myths, his reforming movement was more destructive than constructive.

His was one of the most striking undertakings in ancient religion, and although it did not achieve its purpose, personal religion was enriched (see further under Chapter 24). But his reform was not the only example of what may justly be

called a wave of spiritual energy at a time of decadence and disintegration; and Egyptian literature and Babylonian history combine to tell us of other grievous periods, when, as one sufferer says, 'the plans of the gods are violated,' and his description of conditions confirms his lament that life was hardly worth living.

The Admonitions of Ipuwer tell of social upheaval. Serfs become lords of serfs, officials are slain, the law-books carried off, and there is fratricidal strife. The ploughmen carry shields, and a few lawless try to seize the power. No one

pays taxes and the exchequer is empty. 'Be-
Pessimism in Egyptian literature hold all the craftsmen, they do no work; the enemies of the land impoverish the crafts.' Foreign trade decays, the cattle are left to wander, robbers slay the travellers and become rich; the rich become poor and the poor rich; there is dearth of women, and no conception of children. Khnum (the creator) fashions not men by reason of the state of the land; and 'the land turns round as does a potter's wheel.' Righteousness is only a word; and the scribe cries out in despair: 'If I knew where the god is then would I make offerings to him.'

Yet there is hope: the ideal king who once ruled as Ra the sun god, he is the shepherd of all men; 'when his herds are few he passes the day to gather them together, their hearts being fevered.' And the scribe asks, 'Where is he to-day? Does he sleep perchance? Behold his might is not seen!' Besides this anticipation of a king, a saviour, a true incarnation of Ra, there is another text in which a seer relates to king Sneferu—it is a story thrown back into the remote past—how the land becomes 'upside down'; 'that happens which never happened before.' The god Ra has departed from among men . . . but ultimately a saviour will come and deliver Egypt from her enemies.

Such sentiments, aroused by unhappy conditions, show us that although Hebrew Messianic prophecy is unequalled in its language, yet it had its forerunners; and that the Good Shepherd who knows his sheep had a prototype in ancient

Egypt. And when we turn from these to the dawn of a new age, once more we find similarities, though of another kind. The new king opens up a new era. Sometimes he is of unknown birth like the great Babylonian king, Sargon; and neither Ur-Bau nor Gudea name their father.

Under Ashurbanipal's reign over Assyria (see Chronicle III) prosperity abounds: good government, trade, rain and abundance, friendly gods, rich temples; the old men leap, the children sing, women bring forth their young, the thin become fat, the naked are clothed. . . . We have all the blessings of the Messianic reign!

Specific religious changes, such as we can recognize when Jehu overthrew the old dynasty and became king of Israel in 841 B.C., are not rare. The Fifth Egyptian Dynasty of Heliopolis made the sun cult the state religion. When the Sumerian Urukagina came to the throne of Lagash (c. 2780 B.C.) as the champion and trustee of the god Ningirsu, he introduced various social changes which take the form of a covenant—not like that of the young Josiah with the people, but with the god Ningirsu himself. He at once proceeded to control the avarice of priests and bureaucrats; drastically employing the 'axe'—in the modern and not in the old Oriental sense—he abolished the fees of the diviners, regulated divorce, dealt sternly with theft, and in divers ways sought to lessen the hardships of the poor.

Besides the famous though short-lived religious movement associated with the name of Akhnaton, two others were destined to be of permanent significance for the world's religion. Of these the first takes us to an Aryan or Indo-European god: namely Varuna, one of the many gods of the old invaders of India, who corresponds to the later Ormuzd, or Ahura-Mazda, the 'wise lord,' the supreme god of Zoroastrianism.

Varuna's origin is uncertain, but he stands out conspicuous as a moral god, who more than any other of the gods of the Rig-Veda awakened the sense of moral guilt. To him above all was prayer made for forgiveness. If men sat together and schemed he was there as the third, and knew it; he was 'all-seeing' and 'far-

seeing,' and no one could flee and be free from 'King Varuna.' He punished all wrong, and men pleaded in extenuation

Not our own will betrayed us, but seduction, thoughtlessness, Varuna, wine, dice or anger

The old is near to lead astray the younger, even slumber leadeth men to evil doing

With Varuna was closely associated Mitra, destined in centuries to come to appear as that Mithras whose cult, spread far and wide, was one of the most powerful rivals of early Christianity (see Chap. 74). Both gods, perhaps primarily 'sky' and 'sun,' were essentially gods of covenant, guardians of the ordered life which rests upon implicit and explicit agreements.

Such gods were especially appropriate when new confederations or alliances were being formed after a period of disorder. More than that, Varuna was the patron, guardian or director of order, that is, order in the world of nature, in Man and in the sacrificial ritual. This, called 'rita,' is one of the several far-reaching ideas which we find in ancient Oriental religion, and it was of profound influence on the development of early life and thought. It connoted all that was regular, orderly, effective, acting as it should, and therefore what was 'natural' and 'true to its nature.'

By an interesting development of priestly ritual the order of the universe, no longer depending upon the 'sacred king' or any other individual, was supposed to turn upon

Importance of the sacrificial ceremonial ideas of Order as conducted by the priests. By other developments, as soon as a distinction was made between Man and what we call 'nature,' we find attention expressly directed either to ethical order ('asha'), as in the markedly practical and ethical religion of Zoroastrianism, or else to order in the physical realm, thus opening up the path that led to the dawn of science.

Now while Varuna was the moral god responsible for order in the widest sense, he speedily lost his position and became a mere ruler of storms and tides. Indra was really the chief effective god of the Indian. His people saw him leading them to victory, a blond giant riding in his

chariot and wielding the thunderbolt. He slew the hostile cosmic dragon, and was fond alike of wine and women. He was greatest of gods, and of him it was said, 'no being in heaven or earth has ever equalled him.' So Varuna, the essentially ethical god, lord of universal order, gave way to Indra, the lusty, national god, as unmistakably as Akhnaton's god of the solar disk—perhaps less of an ethical god—gave way to the earlier national cults, and an echo of a great decision may possibly be found in one of the hymns of the Rig-Veda: 'I bid farewell to the great god, the father. I leave the father, for my choice is Indra.'

Though it is not known how the god Varuna was introduced or whence he came—he may not be of Aryan

origin—the history of religion proves that behind the god Varuna & ethical reform this god there must have been some ethical awakening, some great reformer or band of reformers, with convictions of an absolute order and with influence enough to imprint the god and his attributes upon the tribes from whom the ancient religions of India and Persia were derived. Could we but discover it, we should find some event in the history of religion which, in spite of the subsequent deposition of Varuna, should stand by the side of later and more familiar instances of new gods, that is, new conceptions of God, being planted in the hearts of men.

For, as an ethical god, Varuna may be placed next to the Israelite Yahweh, and the difference between the decay of Varuna and the strenuous and successful fight of Hebrew prophets to uphold the supremacy of Yahweh needs more consideration than can be given to it here.

We do not know with any certainty how far back the religion of Yahweh goes. The Old Testament gives us the traditions that prevailed in Israel, but it is important to remember that, although Moses is properly regarded as the most conspicuous figure in the rise of Yahwism, there were those who thought that Yahweh was known from time immemorial—from the days of Adam's grandson (see Genesis 4, 26). There is no doubt, however, that the age in and about the fourteenth century B.C. was a crucial one for religion.

The god Varuna himself probably belongs to an earlier age, but it is a very remarkable fact that, at the later age when Egypt, the Hittite area and the intervening lands were most closely interconnected, the gods Varuna, Mitra and Indra were among those already known in some part at least of Asia Minor, and are found mentioned in a treaty between the Hittites and the Mitannians of North Syria (see Chronicle II). The latter seem to have been a semi-Iranian aristocracy, with offshoots even in Palestine, and they were connected by marriage with the ruling dynasty of Egypt.

Among their names are compounds of 'arta,' another form of 'rita,' so that this noteworthy idea of 'order' would doubtless be familiar at the Egyptian court of the Amenhoteps and elsewhere. Accordingly, while Akhnaton—'living in truth,' as he calls himself—proclaims his interest in 'truth,' and the art of his day is distinguished by its efforts to represent things naturally, as they 'truly' were, among the northern peoples we can trace both the conception of a natural order in the world and among men, and also the recognition of the ethical god Varuna, the guardian of 'rita.'

What effect such ideas as these would have upon early Palestine we can hardly conjecture. Characteristic of Yahwism—as known from later writings—is the insistence upon the supremacy of the God of Israel. He is God of Man and nature, but placed far above both; and His righteousness is an eternal principle such that those who offend Him, even His chosen people, His 'firstborn,' suffer as necessarily as those who obey Him prosper. The uniqueness of the prophets consists in what they taught as to the true way in which He was to be served; and their teaching, roughly six to eight centuries after Akhnaton—some thirteen centuries after Hammurabi—is distinguished from all else that we know of by its ethical monotheism and its inculcation of the principles of national welfare and destiny.

But what the earliest Yahwism was like it would be difficult to say. It would hardly be inferior to the fine ethical teaching of Varuna; though, corresponding to the Indian Indra, the Near East had national storm gods like Adad and Baal with whom Yahweh would be identified, as under the Israelite monarchy when Yahweh and Baal were virtually one.

Early kings were associated with both the bull and storm god (Adad, etc.) and the solar god (Shamash, etc.), the Little trace of Yahweh latter being explicitly in contemporary records—god of justice.

In such cases the more national and the more ethical aspects coalesce, and Shamash and Adad would be one; a tendency towards monotheism can be recognized. Unfortunately we find only doubtful traces of Yahweh in the early contemporary records; and until we have the necessary evidence from excavation or the monuments, the problem of the rise of Yahwism remains unsolved. This problem turns on two inquiries.

The first concerns the light which the study of ancient monuments throws upon the religious conditions in and about the fourteenth century B.C. The second concerns the 'reconstructions' which biblical scholars put forward as the result of their analysis and criticism of the very composite and relatively late records contained in the Old Testament. Such 'reconstructions' are indispensable, owing to the character of the evidence; and one will be found in Chapter 27.

Of these inquiries the study of Oriental religion with special reference to Palestine and neighbouring lands is, in some respects, the more objective task; and in the opinion of the present writer it is of the first importance by reason of the lateness of the biblical records. For the latter were written to inculcate particular views of the religious history of Israel, and these views, there is good reason to believe, belong to the age of the great prophets and after, their permanent value for the history of religion being superior to their value for ancient history.

Chronicle II

DAWN: 1580—900 B.C.

AT the beginning of the sixteenth century B.C. a blight of anarchy was passing away; but the world, the 'known world,' was not what it had been when the blight descended upon the old civilizations of Senusret and Hammurabi. Those old civilizations were not dead; but they re-emerged with a difference.

Egypt, it is true, rose again with a phoenix-like recuperation of power, but the unification of Mesopotamia had broken down under the disintegrating influence of barbarian invaders, and these had not yet learnt to organize new empires. While the Kassite conquerors turned themselves into Babylonians, upper Mesopotamia was not merged into Babylonia, but was dominated by the new half-alien power of Mitanni, in the bend of the Euphrates north-west and west of Assyria; between these nether and upper millstones lay Assyria, not crushed but not yet terrible, and probably with an independence but recently won from Mitannian overlordship. And on the north-western hills still lowered the Hittite storm-cloud.

Syria a Bridge between the Powers

No less conspicuous was the change which had taken place in the great Syrian area which intervened between the northern powers and Egypt. In the old days the shifting tribes of Semites who populated that region had never constituted a power, until the confederacy was formed of which the Hyksos monarchy in Egypt was presumably an off-shoot, perhaps the head. The Hyksos had gone, but the confederacy remained, however loosely knit together. What a powerful Beduin league had done in the past, Syria united under strong leadership might accomplish again, with the added incentive of vengeance for the Semitic débâcle in Egypt.

Moreover, Syria had now become not a barrier but a link, not a gulf but a bridge, between north and south; all the powers had an interest in the Syrian problem,

but immediately and most obviously Egypt. And it was Egypt's solution of the problem that brought her at last into direct political contact with the northern peoples, which during the earlier stages remained for the most part inactive.

When in 1580 B.C. Aahmes the Liberator flung the foreign tyrants in rout over the Egyptian border, unconsciously inaugurating a new era, not alone for Egypt, but for the civilized world, he was only at the beginning of his work. He had to consolidate a kingdom, and he had first to secure it against a renewal of the Semite aggression. Across the border the Semite power was far from being broken.

Military Regeneration in Egypt

ACCORDINGLY, immediately after the expulsion, we find Aahmes engaged in a strenuous campaign in southern Palestine, where he laid stubborn siege to the fortress of Sharuhén, probably in what was later Judea. Sharuhén held out for three years before it fell: evidence that the campaign was no mere raid like that of Senusret, but had a serious purpose, and was waged against a still powerful foe. Moreover, we again find his armies battling successfully in north Palestine and Phœnicia. The probable object of these campaigns was not an imperial expansion but the security and consolidation of the restored kingdom of Egypt. The Syrian wars of Aahmes were no more than the completion of the war of liberation.

The menace from Asia being thoroughly curbed, Aahmes and his immediate successor Amenhotep I (1557—1541 B.C.) had a sufficiently heavy task before them in the reorganization of the state and the recovery of the upper Nile. In the nature of things, it was only through a new military system that the new monarchy could be established, and a new art of war was developed when the Egyptians learnt to appreciate on Syrian soil the possibilities of the war-chariot.

Aahmes must have shaped the organization. He had loyal supporters, but there was a serious disloyal element ready to take advantage of his embarrassments, especially in the south. When his successor Amenhotep found it necessary to march into Nubia, rebels rose in his rear with whom his officers dealt faithfully; but the fact shows how hard it was to restore the central authority after two centuries of disintegration. At this point, however, our records become less complete, having hitherto been derived from the autobiographical memoirs of a notable servant of these two kings, Aahmes the son of Ebana, who took an active part in most of the campaigning, but soon after this disappears from the stage.

The power of the dynasty was fully established by the time of the accession of Thothmes I as husband of Amenhotep's daughter (also named Aahmes), some forty years after the liberation. The Nubians, however, between the Second and Fourth Cataracts were still incompletely subdued, and almost the last record of the old Aahmes, son of Ebana, tells of their subjugation at the beginning of the new reign.

Thothmes looked upon Syria as part of his dominion, though his predecessors must have had little enough hold on it and it ignored his sovereignty. He set about a conquest, but only in the old style; that is to say, conquest was not accompanied or followed by the organization of effective control. He marched as far north as



SCENE OF THE EARLIEST IMPERIAL EXPANSIONS THAT HISTORY RECORDS

As far as possible this map shows the political situations in the Near East during the eventful period between 1580 and 900 B.C., which saw the rise and fall of Egyptian and Hittite empires, the first rumblings of the Assyrian volcano and the appearance of those new peoples to whom the history of the future belonged. Arrows show important racial movements, without indicating exact routes—for these see Chap. 26. The full extent of Egyptian dominions is shown in Chap. 22.

Naharin, the region lying between the Orontes and the Euphrates, meeting generally with little resistance but winning a great victory; and he set up a stele beside the great river. Then he returned home proclaiming that he had made the 'circuit of the sun' the boundary of Egypt.

Back in Egypt, he set himself to the restoration of past splendours. But the annals at the close of his reign (about 1501 B.C.) are complicated by an unsolved puzzle about the succession.

Queen Hatshepsut's Golden Days

THOTHMES had a daughter by his queen Aahmes, who represented the line of Aahmes the liberator. This daughter, Hatshepsut, he had recognized as the legitimate successor to the throne which he himself occupied because he was her mother's husband. By inferior wives he had also two sons—or just possibly a son and a grandson—both named Thothmes. Presumably in order to keep the succession in the royal family, Hatshepsut was married to the younger.

Now it is certain that the elder was Pharaoh, as Thothmes II, with or without a co-regent, for two or three years. It is certain that Hatshepsut reigned for several years as independent sovereign, and was able in spite of her sex to ignore her young husband's title, which only attached to him through her. It is certain, too, that both she and her husband Thothmes III, who ruled gloriously for many years after her death, dated their reigns from 1501. But whether the brief reign of Thothmes II preceded their accession, in opposition to the wishes of the old Thothmes I, or was a revolutionary episode in Hatshepsut's first years, is an undecided question.

That Thothmes III resented intensely the treatment he suffered at her hands, and afterwards did his best to obliterate her memory, is not to be denied. It is to his deliberate defacement of her monuments that we owe this tangle of obscurity.

But the surprising fact remains that for some twenty years a queen not only reigned but ruled in Egypt, relegating her exceptionally able spouse to the position of a mere consort, though there was no precedent for such a happening. Indeed,



THE 'NAPOLEON OF EGYPT'

A brilliant general with a comparatively scientific understanding of warfare, and the vitality required for active campaigning, Thothmes III by force of arms and bellicose display greatly extended Egyptian influence in Syria and Nubia.

Cairo Museum

so ingrained were the conventions attached to a male ruler that on her monuments she is represented with a beard and in male attire (see page 373); certainly in her rule she displayed a masculine energy.

WAR not being her province, since she could not lead armies in the field, she indulged in no foreign excursions of a military order. The country was not threatened on any side; and to give Thothmes the chance of outshining her by winning the military honours for which his soul craved would by no means have suited her. But under her rule Egypt flourished exceedingly, if the splendours of her temple building and temple restorations are any criterion of the national wealth and prosperity.

The most remarkable of her efforts, however, was a grand expedition by land and water to Punt, where no Egyptian had been seen for untold years—an entirely friendly expedition with no

thought of war. It returned most richly laden with the products of that region, and is magnificently commemorated on the walls of the splendid queen's splendid temple at Deir el-Bahri, opposite Thebes.

With her death, in 1480-79 B.C., the energies of Thothmes III were released from the shackles she had imposed on them. We have come to the reign of the man who is perhaps entitled to be called the prototype of constructive empire builders; a conqueror, but no mere captain of victorious armies; a statesman even more than a warrior, though a warrior of genius.

In 1479—that is, at the earliest possible moment after the death of Hatshepsut—Thothmes set out on his first Asiatic campaign. It was more than time, if the work of his predecessors was to be pre-

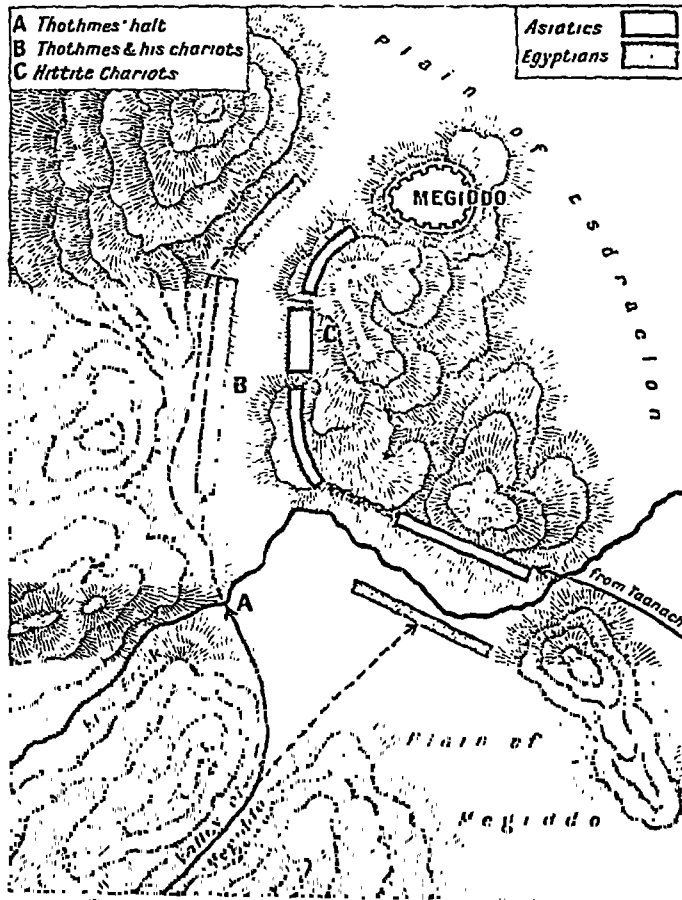
served. Since Thothmes I had planted his boundary stone on the bank of the Euphrates, the only expedition into Syria had been a raid led by Thothmes II during his brief reign. The Syrians, once the masters of Egypt, had no mind to remain the subjects of the Pharaoh, and a great confederation was in arms in the north.

The headquarters of the confederates lay at Kadesh on the Orontes, whose king was no doubt the moving spirit of the league. All Syria would seem to have joined it, except the chiefs of southern Palestine, on whom the first onslaught would fall. Thothmes kept a systematic account of his operations; those written records have not survived, but from them were extracted the monumental records which enter into great detail. For the first time in the world's history we have

revealed to us a captain of the highest rank not only as a fighting man but also as a strategist and a military organizer.

In April, 1479, Thothmes had assembled his army on the frontier of Egypt proper. Nine days later he was at Gaza, on the twenty-second anniversary of his formal accession. He did not pause to celebrate it, but was on the march again next morning. The confederates, rebels from his point of view, had gathered in force with their base at Megiddo on the other side of the ridge of Mount Carmel, to bar the route by which an invading force from the south must enter Syria. No resistance was to be looked for in the south; in ten days he was at the eastern foothills of Carmel.

Megiddo lay at the far mouth of a very narrow pass. Apart from this, he might follow the main route, skirting the south of Carmel, or turn the enemy's position by way of a broader pass on the north. Through the Megiddo



TACTICS OF THE BATTLE OF MEGIDDO

Megiddo, with three roads converging thereon, blocked the route to North Syria. The Syrians were guarding the obvious open road by Taanach; Thothmes III flung his army through the narrow central pass and gave successful battle to the hurriedly recalled enemy beneath the walls of the town.

pass his army would have to move often in single file ; as his council of war pointed out, it might very well be trapped and cut to pieces. But the king's calculated audacity overruled the counsels of caution. Others were free to take what route they chose ; he was going through the pass at the head of those who dared to follow.

First of the many Battles of Megiddo

AUDACITY succeeded. The whole army of course followed the intrepid king ; no preparation had been made on the other side for a move so unexpected, no resistance of consequence was met with, and the troops were able to form up on the comparatively open ground at the mouth of the pass, while the surprised enemy, who seem to have been at Taanach guarding the southern route, hastily threw themselves between Thothmes and the town. The chariots must have found the pass rough going ; but the whole force had been carried through and re-formed in less than twelve hours—a fair proof of the smallness of the expeditionary army.

It was too late in the day to deliver battle. Troops were flung out to right and left to cut off the enemy's retreat and, in case of defeat, to cover a line of retirement. When battle was joined next morning, the king, leading the charge of his troops, broke the enemy's centre, and the Syrians were soon flying in headlong rout to the walls of Megiddo, which closed its gates, but let down sheets whereby the fugitive princes, including the kings of Kadesh and Megiddo, were hauled over the battlements. But to the exceeding wrath of Thothmes the victorious troops, instead of completing their work, fell on the camp wherein was vast booty ; consequently the king of Kadesh was able to escape before the exits could be blocked.

The first battle on the field of Armageddon ('Har-Megiddo'—the Mountain of Megiddo) had been fought and won, but by no means the last. The town was closely invested, and gradually starved into surrender while the besiegers lived on the country. Meantime, from far and near the chiefs who had not been with the defeated army came in to make their submission to Thothmes. After some weeks,

the despairing princes within the beleaguered city threw themselves on the mercy of the conqueror, who entered its gates in triumph. Immense spoils were carried off, and the harvest of the plain of Esdraelon was commandeered ; but no vindictiveness was displayed towards the vanquished. Thothmes contented himself with the very substantial indemnities provided mainly by the treasures in Megiddo.

The campaign was completed by a rapid march to the foot of the Lebanon, where further submissions were received and a fortress was planted and garrisoned. The chiefs who had been in arms were probably dispossessed and others whose loyalty might be relied upon put in their places. As a further security, both immediate and for the future, their sons were sent to Egypt to receive an imperial education, to imbibe Egyptian ideas and in due time to return to the government of their own people imbued with a spirit of intelligent loyalty. Six months after leaving the Egyptian frontier the conqueror was back at Thebes, endowing the supreme god Amen with the unexampled fruits of his victories.

Consolidating Egypt's Syrian Empire

IN each of the three following years Thothmes conducted a bloodless 'campaign' through the territories which he had restored to Egypt ; confirming his authority, but postponing further military adventures till all should be thoroughly secured. On one of these progresses he had the satisfaction of receiving a gift-bearing embassy from distant Ashur, then the chief town of Assyria, proving the wide renown of his achievements.

Then fell an interval during which he was laying far-sighted plans for future campaigns. To reach the distant and still defiant Kadesh, he needed a new base ; and he conceived the idea, brilliant for his days, of turning the Syrian position by sea, at the same time avoiding the difficult terrain of Palestine. Thus in the seventh year a great fleet transported him to northern Phœnicia, which on the fall of Arvad made ready submission and for many years afforded Egypt a secure naval base in the north. The next year's

campaign saw the fall of Kadesh, hitherto the stubborn centre of Syrian hostility. The policy followed in southern Syria was repeated in the north, though another by no means bloodless campaign was needed before all resistance was quelled in the maritime cities.

Napoleonic Genius of Thothmes III

BYOND Kadesh, however, was Naharin. and behind Naharin again was the powerful state of Mitanni—the first probably Aryan-speaking power to appear on the scene, since Babylon retained its indigenous character in spite of its Kassite dynasty; and at most the Aryan character of the Kassites is doubtful. That the Mitannian ruling family spoke an Aryan tongue and worshipped Aryan gods is certain, but whether they were of the same blood and speech as their subjects we cannot be sure.

Mitanni must have been anxious to preserve the Naharin barrier between herself and the aggressive warrior of Egypt. The eighth expedition was directed from Phoenicia upon Naharin; her cities fell before Thothmes, who smote a Mitannian force at Carchemish, reached the Euphrates and crossed it, and planted his boundary-stone on its farther side. But, true to his principle, he halted to organize before carrying his arms farther.

In fact, when Thothmes reached the Euphrates, the limit beyond which his predecessors had at no time claimed

dominion, he abandoned, if he had ever entertained, the idea of further expansion. He crossed the Euphrates merely by way of a demonstration that he had done something which no one before him had succeeded in accomplishing.

Such was the fear inspired by his invincible prowess—unwontedly free though it was from what we have learnt to call frightfulness—that even from the land of Hatti beyond the Taurus (see Chap. 23) the Hittites thought it politic to send the complimentary gifts which by him were naturally styled tribute; nor was it long before he received similar compliments from Cyprus over the sea—if Alashiya is to be identified with Cyprus, and not with a district on the southern coast of Asia Minor. Taurus and Euphrates were natural physical boundaries beyond which it would never be practicable to exercise efficient control, and only one more campaign was needed to round off the empire by subjugating what was still unsubdued on this side of Taurus.

FOR nine more years, however, the regular military demonstrations or progresses were annually repeated, usually from Phoenicia. Sometimes they were real campaigns, when rebellion attempted to make head in the north, or, as once, in the south. But for the last ten years of the reign even demonstrations ceased to be necessary. Peace was unbroken from the Euphrates to the Nile.



DEFEATED AND HUMBLD BY THE WARRIOR PHARAOH

An epitome of the far-reaching conquests of Thothmes III, this throne painting represents a group of supplicants containing representatives of peoples vanquished by him. Of the fair-skinned men, one—he on the left with a shawl draped over his shoulders—may be a Mitannian, while the other is a Semite from Syria. The negroes with the typical insignia of African warriors—ostrich feathers stuck in the hair and leopard tails attached to their loin-cloths—are Nubians.

From Wrezinski, Allägyptischen Kulturgeschichte

Some six months of nearly every year, for twenty years after the death of Hatshepsut, had been passed by Thothmes in Asia. In his absences, the administration of Egypt itself was the care of trusty viziers—in medieval England they would have been called justiciars. But whenever he was at home, Thothmes was immensely energetic in every department of government, as well as in the execution of innumerable public works. Incidentally, he found time for campaigns in Nubia, which brought the Nile country under complete control at least as far as the Third Cataract; and the oases on the west of the river were placed in direct charge of an officer of state.

By personal tours of inspection and supervision he ensured the sound administration of justice together with the honest and equitable collection of revenue. It is evident that all the productive resources of the country were actively developed, and the products of foreign climes poured into Egypt, from without the empire as well as from within it.

The organization of the Asiatic empire of Thothmes presents remarkable features, though our knowledge of details is small. We can discern in it what might almost be called suggestions of the relations to-day between the Supreme Government in India and the 'Protected Princes.' Native princes continued to rule in the subject principalities, conditionally on their good behaviour, including the regular payment of the recognized tribute. In some instances they were attended by an imperial officer who discharged the functions of a British Resident. Egyptian garrisons were stationed in fortresses at strategic points. The north was under the general supervision of a military governor.



POWERFUL RULER

Celebrated for his warlike valour, Amenhotep II successfully reaffirmed the conquests of his father, Thothmes III, and gave Egypt twenty years of peace.

Cairo Museum

Every effort was made to bring the native rulers into sympathy with Egyptian and imperial ideas, especially by educating them in the princes' college at Thebes. There was no interference with native religious or other customs. The rule was a foreign rule, established at the sword's point, and was felt and represented as such; but it was a rule beneficent and irresistible, which gave to the weak a secure protection against their stronger neighbours.

Thothmes died a month before the completion of the fifty-fourth year of his nominal and thirty-third of his unfettered reign. His successor was his son, Amenhotep II (1447-1420 B.C.), whom he had associated with himself on the throne a year or two earlier.

It was long since the secretly hostile princes of Syria had ventured to attempt rebellion. The death of the old king was the opportunity for which they had been waiting, and they promptly rose to arms. The new king was no less prompt. Within a month from his father's death he was on the march from Egypt. Before another month was past he had routed the advance force of the enemy in northern Palestine, performing mighty deeds of personal prowess at the head of his troops—he was a big man, of whom it was said that none in his army was strong enough to draw his bow. Before the swift rush of his march resistance crumpled up. As he swung up to the Euphrates, a cowering embassy from Mitanni came to implore grace. The rebellion collapsed utterly and never again ventured to raise its head during the life of this Egyptian *Coeur-de-Lion*.

Amenhotep returned to Egypt in triumph after his brief tornado-like campaign. He sailed up to Thebes with seven

captive kings hanging alive head downward from his prow; six of them he slew in the temple of Amen, as an acceptable sacrifice to the god. The victory in the north was followed up by a campaign in Nubia, which carried his southern frontier to the Fourth Cataract, where the seventh of the northern princes was hung up on the walls of Napata as a grim warning to rebels.

The statesmanship of Thothmes made him a lenient conqueror; Amenhotep could certainly be a thoroughgoing barbarian when it suited him. Once was enough, however; the need—or the opportunity—never recurred. But there is no warrant for reproaching the cruelty of Amenhotep. The methods of Samuel and David were no less drastic; every campaign was attended by the deportation of slaves by the hundred, and human sacrifices were a matter of course.

Amenhotep had proved himself a mighty man of his hands, and a commander in the field who was no unworthy son of the great Thothmes. Nevertheless, he was not moved to any further military exploits in the remaining twenty years or more of his reign. There is no record of later campaigns. The irresistible strength of the government had been decisively demon-

strated, and Egypt enjoyed apparently unbroken peace and prosperity.

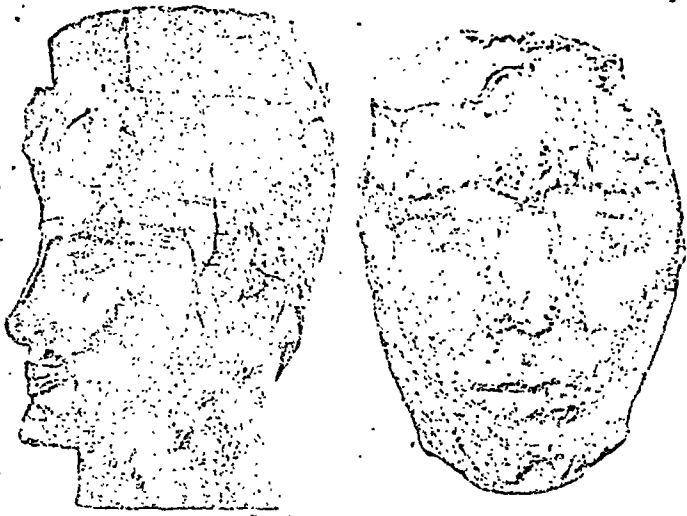
It was a matter of course, however, that his death (c. 1420) should be the signal for risings in the remote provinces of the empire. At any rate, his son Thothmes IV had to undertake a campaign in Naharin, from which he returned with spoils and slaves. It was also made the occasion for the opening of friendly diplomatic relations with Mitanni. Probably the far northern power was growing fearful of the aggression of its Anatolian neighbours, the Hittites; who were the more dangerous because the Taurus barrier practically secured them from attack. Naharin and Phoenicia were similarly exposed to the Hittites, whom Mitanni and Egypt had a common interest in checking.

First Royal Marriage for Reasons of State

WE may assume that the overtures had come from Mitanni, which had been thoroughly taught to fear the power of the southern empire. Having failed to preserve a buffer in Naharin, policy required friendly relations. Babylonia, always pacific, also offered amity. The result was an unprecedented departure from Egyptian practice; Thothmes IV invited

a Mitannian princess to become his queen—the first instance of a political alliance cemented by a royal marriage. In due time Mute-muya (to give her her Egyptian name) became, it is said, the mother of the next emperor, Amenhotep III—though this is difficult to believe, since the reign of Thothmes seems hardly to have exceeded ten years, so that the child would scarcely have been eight at his accession. Perhaps the Mitannian was not Mutemuya but her successor as 'chief wife.'

A campaign at the southern as well as the northern extremity of the empire was almost a matter of course. But the might of Egypt was too well es-



MOST SPLENDID OF THE PHARAOHS

When Amenhotep III succeeded to the throne, Egypt was flourishing and at peace; his government was able enough to maintain these conditions and to command respect. Free from political anxieties, the king devoted himself to artistic magnificence—the cast above (right) is probably his actual death-mask.

Photo, left, Mansell; right, Berlin Museum

established for such operations to be regarded as anything more than punitive expeditions into the outskirts of the empire, reminders that the arm of the supreme government was a long one and its power not to be disputed with impunity. There were no clouds on the imperial horizon when Amenhotep III ascended the throne of the Pharaohs in 1411.

During the thirty-six years of his reign Amenhotep III seems once and only once to have taken part in even the semblance of a military expedition. This was into Nubia, in his fourth year (no more than thirteen years after his father married the Mitannian princess, who can therefore hardly have been his mother). For the rest of the reign, the imperial peace seems to have been unbroken.

Egypt at the Zenith of her Magnificence

IN the reign of Amenhotep III Egypt was at the height of her power, the zenith of her magnificence. Of all her rulers he was the most splendid. Wealth poured into his treasury, to be poured out in a correspondingly lavish expenditure on every form of art. He had no political or military anxieties to vex him. With all the Mesopotamian powers on the best of terms, there seemed to be no danger of external attack, and the organization of the empire created by his forebears had reached such perfection that no internal disturbance was to be feared. With the wealth that lay to his hand, he need stint himself in nothing of his desires, and his desires were all in the direction of artistic magnificence. In all this, the reign of Amenhotep III was the golden age of Egypt. He was her 'Roi Soleil.'

The contemporary historical documents, apart from the monuments, are particularly illuminating. For his reign and that of his son we have the singular mass of diplomatic correspondence, known from the place where they were discovered as the Tell el-Amarna letters.

Since the Kassite conquest in Babylonia, our narrative has carried us across the Euphrates only at the moment when a Thothmes or an Amenhotep thought fit to set up a boundary-stone on its farther bank in celebration of victory won on the

hither side. The meagre chronicles of the Mesopotamian regions give us no events to record. In Babylonia a foreign dynasty reigned, but with little about it that was foreign save the names of its princes. Elam had long been inactive; the Sea Country as a separate state had passed away; no new invaders later than the Kassites had burst in from the mountains. Babylon, as the sacred city and the seat of the monarchy, enjoyed a dignified prestige, but was placidly unaggressive. Her pretensions to sovereignty were unchallenged, perhaps because they were practically ineffectual. Ashur acknowledged her authority as a polite convention.

At some not clearly distinguishable stage the state of Mitanni, under its Aryan rulers, had developed in upper Mesopotamia: a distant forerunner of the Medes and Persians, an advance guard of the Aryan migration, but content to abide in her settlements without further extension of conquest. With Assyrians on the east, Syrians—now under the sway of Egypt, since their confederation had failed to transform itself into an empire—on the south-west, and the Hittite storm-cloud on the Taurus, her interest was certainly peace. For each and all of the Mesopotamian states it had become a matter of primary importance to conciliate the mighty empire of the south.

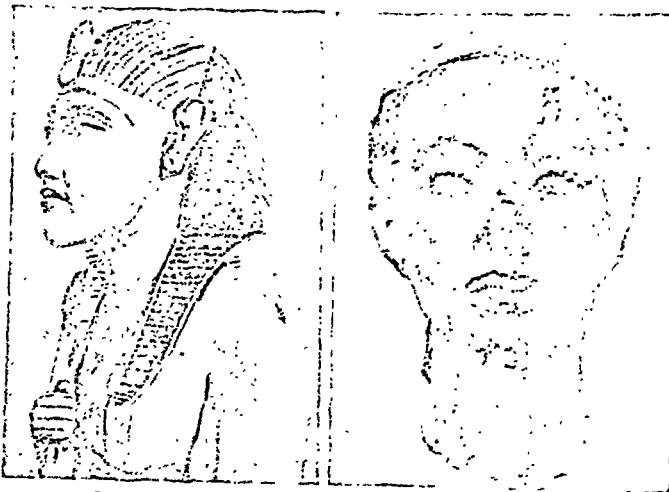
Amicable Relations with Mitanni and Babylon

MITANNI had been taught her lesson once for all by Thothmes III; she had humbled herself before Amenhotep II; she had definitely made her peace with Thothmes IV when he honoured her by receiving her king's daughter as his wife. It is difficult, as has been remarked, to believe that Amenhotep III was that lady's son; but he received a niece of hers into his harem, though not as his chief wife (a position already occupied), and later a great-niece to be the chief wife of his heir. He also wedded a daughter of Babylon, and married a daughter of his own either to the king of Babylon himself or to his heir. The kings address each other as 'My Brother,' but there is an obvious suggestion that the Egyptian brother was the bigger.

Yet amidst all this splendour might have been detected warnings of trouble to be guarded against; they remained unheeded. Where there were any signs of defection, it was so easily suppressed that the Pharaoh no longer saw need for the progresses through Asia which none of his predecessors had neglected. From the far north came warnings of Hittite raids, but a Hittite attack on Mitanni had been heavily defeated by its king, Dushratta. Amenhotep declined to regard as serious the appeals of his provincial governors for more active measures; and the empire paid the penalty in the reign (1375-1358 B.C.) of his son Amenhotep IV, better known as Akhnaton.

The Cost of Unpractical Idealism

IN this chronicle we are not concerned with the doings of Akhnaton as a reforming enthusiast and idealist in art, morals and religion, a seeker after truth who attempted to impose his own spiritual conceptions on an age and a people very far from spiritual—these are the subject of Chapter 24. Great idealists have also been great practical rulers and statesmen, but Akhnaton was not of these. As a king, he was a failure. Absorbed in his religious revolution, he neglected entirely the practical tasks of government.



HERETIC KING WHO LOST THE EMPIRE

Preoccupied with his religious reforms and his philosophy, Akhnaton was content to let the Egyptian dependencies in Palestine and Syria slip from his possession. Intelligent as he appears in these portraits (that on the right is a contemporary cast), he yet seems to have lacked all practical ability.

The Louvre and Berlin Museum

The machinery broke down and rapid disintegration of the empire set in.

Although at the close of the reign of Amenhotep III the loyal princes in the north were painfully aware of the disloyal element and of the Hittite menace, they had failed to convince the Pharaoh of the danger. No sudden storm burst immediately on his son's accession. The Hittite king was anxious to lull suspicions, and among the Syrian princes the arch-traitor Aziru the Amorite was an adept in the art of giving a plausible colour of loyalty to his most disloyal operations. In spite of urgent appeals, the loyalists were not reinforced, while city after city was falling into the hands of Aziru or his Hittite ally, and Dushratta of Mitanni and Burra-Buriash of Babylon were clamouring for the gold that Egypt could so easily supply.

EVIDENTLY the Egyptian governors and residents appointed in the latter years were not of the calibre required in an emergency, and paralysed the loyalists instead of helping them. Farther south, Palestine was in chaos, overrun by the Khabiru—desert tribes, suspected by some of being the 'Hebrew' conquerors of Canaan, and almost certainly not unconnected with them in some way. And

Amenhotep at home was too busy replacing the worship of Amen by that of the Aton, and changing his own name to 'Akhn-Aton,' to give attention to the needs of his Asiatic subjects; though incidentally he was lending his countenance to Assyria and recognizing her independence, despite the remonstrances of both Babylon and Mitanni, each of which claimed to be her suzerain.

The paralysis of Egypt continued till the middle of the century. The revolutionary king was probably no more than thirty when he died; of his three immediate successors, two, Sakere and Tutankhamen, were his sons-in-law, while the third, Ay, was a figurehead,

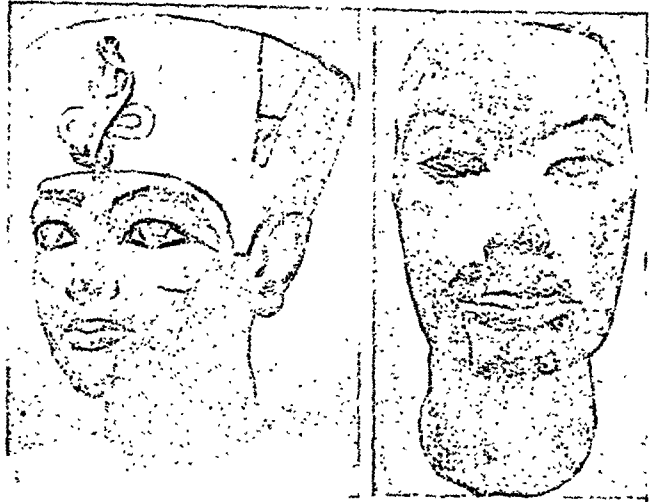
perhaps placed on the throne by Horemheb, or Harmhab, who may be reckoned as either the last of the Eighteenth or first of the Nineteenth Dynasty. Tutankh-Amen, by the changing of his name from Tutankh-Aton, marks the collapse of Akhnaton's idealist 'heresy' and the recovery of power by the priesthood of Amen. An attempt was made in his reign to reassert the imperial authority in Asia, but it was already too late. The empire created by the genius of Thothmes III had passed away.

Under a government efficiently controlled and directed, by a competent head and competent viceroys, the disruptive movement in Syria would have met with no more success than those that had preceded it during the past century. As matters stood, it was the craft of the very able Hittite king, Subbiluliuma (1395-1350 B.C.), that fostered the movement and turned it to full account. Cunning as Aziru was, he was, in fact, only the cat's-paw of the Hittite; if he shook off the yoke of Egypt, it was but to find himself the vassal of Hatti.

Asia in the Melting-pot

UNWITTINGLY, Akhnaton's religious revolution was responsible for a revolution in the international system. When Horemheb, having probably been for some time the saving power behind the throne, himself assumed the responsibility of the crown, Asia had been passing through the melting-pot. Subbiluliuma had absorbed Naharin and the coastlands, from the Euphrates to the Mediterranean, and Mitanni, too, had disappeared into the Hittite maw, or partly into that of Assyria; while Babylon was rather dependent on Assyria than Assyria on Babylon.

The Hittite power and Assyria had adopted similar methods; they had not conquered Mitanni and Babylon, but had



HEIRS TO A DIMINISHED INHERITANCE

Second of the three insignificant successors of Akhnaton, Tutankhamen (left) was incapable of repairing the damage caused by the reformer but did attempt to renew Egyptian authority in Palestine. He was succeeded by Ay, who was Pharaoh from 1353 to 1350 B.C. This cast (right), probably a life-mask, has been thought to represent him.

From Carter and Mace, 'The Tomb of Tutankhamen,' and the Berlin Museum

intervened in dynastic revolutions. In Mitanni at least the established prince was merely Subbiluliuma's puppet; we hear no more of her as an independent power; while in Syria Aziru had preferred submission to challenging destruction.

Horemheb was an Egyptian noble apparently unconnected with the royal family. He had discharged numerous administrative functions with efficiency, evidently retaining the confidence of Akhnaton himself and his successors in spite of his adherence to the old religion. Finally, his influence and authority with the Amen party, joined with loyalty to the throne, had led to his endowment with official powers practically amounting to a dictatorship. On the death of Ay (c. 1350) there was no one with a clear title to the succession; he was obviously the necessary man of the hour; the army was in his hands, there were no rivals, and the divine oracles were prompt to give their sanction. He provided himself with a formal title by marrying the sister of Akhnaton's queen, and ascended the throne of the Pharaohs.

His business was a conservative reconstruction. Ambitious imperial schemes were out of the question until a sound



NOBLE WHO BECAME KING

Commander of Tutankhamen's armies—he is here represented with his baton in his hand—and dictator during the reign of Ay. Horemheb succeeded the latter as Pharaoh, when he inaugurated a policy of vigorous reconstruction.

Cairo Museum

system of domestic administration had been restored and brought into thorough working order. Corruption, peculation, official oppression, evasion of the law, downright lawlessness, were rife. The cleansing of the Augean stable required infinite courage, tenacity and patience, a ruler of character rather than of genius. Egypt had found one who could make it his sole boast that he had wholeheartedly sought the welfare of Egypt. The stable was cleansed, and was kept clean. Horemheb was an old and tired man before his reign was ended (1321 B.C.); but during that reign he had done a king's work for the people over whom he ruled.

Rameses I, the man whom Horemheb had chosen to be his own successor, was presumably of the old blood-royal. He survived for a year or two years only; but he had already associated with himself on the throne his son Seti I (1320-1300 B.C.), a prince well fitted to carry on the task of revival.

Even through the period of disintegration, Egypt had kept a hold on Nubia, and to some extent on southern Palestine

or Canaan; there, however, it can have amounted to little more than a somewhat uncertain collection of tribute. The Beduins who were overrunning the land—whether they were Hebrews or not—would no doubt pay under mild pressure, while the restoration of order in Palestine must perforce await the restoration of order in Egypt. With the exception of one expedition, probably under Tutankhamen, no considerable Egyptian force had been in the country for the better part of a century. On the other hand, its 'milk and honey' had not been a bait sufficient to bring down the Hittites or Amorites.

Asiatic Adventures of Seti I

SETI as crown prince had conducted a little frontier war with Nubia as a necessary display of authority, with the customary complement of spoils and captives. Evidently he had decided that the time had come to restore in what was left of the outlying portions of the old empire the order which Horemheb had re-established in the Nile valley.

The first move was a march on Palestine. An attack by the desert tribes of Edom was scattered. Seti marched by the usual coast route through southern Palestine unresisted, entered Megiddo, and pushed north as far as the Lebanon and Tyre, receiving the submission of the princes. The march had been more a demonstration than a campaign, but it had served its purpose of bringing the country and the coast under control as far as the districts now claimed by the Hittite king or his Amorite vassals. With them there was no collision, such as in the time of Thothmes III would have been inevitable. Conditions had changed.

Seti returned to Egypt in triumph. The Libyans on the west had been making experimental raids on the Delta and required a lesson before he made his second and last Asiatic expedition to confirm the effects of the first. On this occasion there was an engagement with Hittite forces in which the latter were routed; but no attempt was made to extend conquest. In effect it was tacitly admitted that what Hatti had taken during the period of Egyptian disruption, she had taken.

The conquests of Thothmes III had been won not from the grasp of a consolidated state, but by a systematised series of campaigns against a confederation of small principalities with no common head, each conquest having been organized before he proceeded to the next. Subbiluliuma of Hatti had in his turn engorged the Syrian artichoke leaf by leaf, never colliding with a great power, while Egypt was out of action. Mursil, a successor of Subbiluliuma, was in possession now (1345-1320 B.C.), and to evict him would perhaps have been a task too hard even for a Thothmes.

Seti did not attempt it. There was no likelihood of counter-aggression on the part of the Hittite, and the two powers came to an agreement satisfactory to both, each recognizing the rights of the other in the territory where its sovereignty was actually established. If Seti returned with a few Hittite captives, the official fiction that he had 'conquered' Hatti did not trouble the Hittite king.

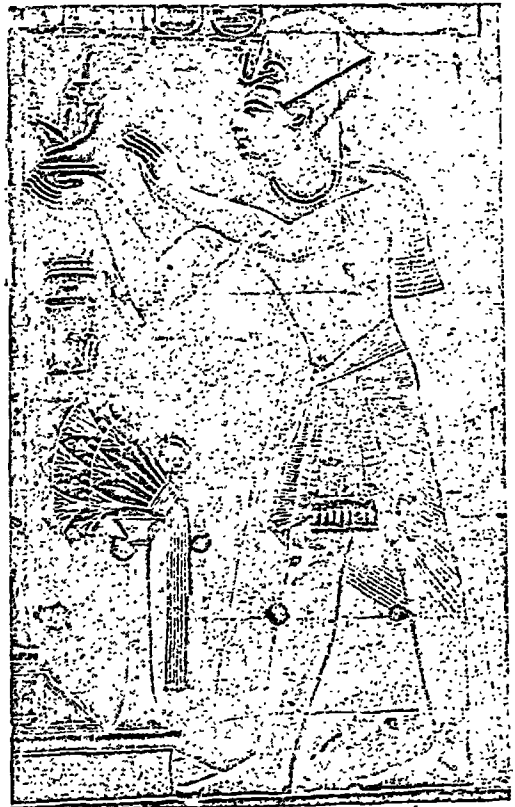
Though Seti reigned for twenty years he attempted no further conquest of Asia. He carried out public works on a great scale of magnificence, but also others which were or ought to be of direct benefit, notably the sinking and protection of wells—not always with success. Before his death he secured the succession of his eldest son; but he was hardly in his grave when his second son Rameses II (1300-1225 B.C.) supplanted his elder brother, who not only disappeared himself but was forthwith effaced from the monuments on which, as crown prince, he had been portrayed.

Rameses II never hesitated to efface anyone whose honours he could thereby more easily appropriate to himself, and achieve a spurious glory in addition to that to which his own deeds entitled him. The obliteration

of a portrait of his brother as crown prince, for which his own was substituted, is still traceable.

Endowed with an enormous self-confidence and unsurpassed egotism, Rameses resolved to recover all the imperial glories of the past in his own person. The fourth year of his reign saw him, in imitation of the great Thothmes, establishing his hold on the northern coastland; early in the fifth (1296), he was on the march against Mutallis, the Hittite king, who, in preparation for the attack, had gathered a great army and occupied the commanding strategic position at Kadesh.

Advancing from the coast with his force in four divisions named after the four great gods—Amen, Ra, Ptah and Sutekh—Rameses was skilfully drawn into a trap which all but wrought his ruin.



RESTORER OF IMPERIAL GREATNESS

With Egypt again consolidated within, Seti I recovered for her the effective control of much of Palestine and Syria. Here we may compare, side by side, his mummified head, and a bas-relief of him at Abydos.

Photos, Mansell and Sevak

Deceived into believing that the enemy had fallen back, he flung himself on Kadesh with the Amen division, leaving the others far in the rear. The Hittites and their allies, ambushed behind the town, suddenly launched their chariots upon the Ra division as it straggled up, cut it in two, broke into Amen's encampment, routing most of the unprepared occupants, and would have annihilated the King and his personal bodyguard but for the desperate valour with which he headed chariot charge after charge against them.

Meanwhile, news of the disaster reached the tardy Ptah division, which arrived on the scene just in time to fall on the rear of the enemy and turn the tables on them. The Hittite chariots were driven into the river, some of them making the farther bank, where the infantry was standing; but to attempt a renewal of the battle was hopeless.



GUIDED BY VAST AMBITIONS

In attempting grandiose conquests in Asia, Ramses II was actuated by hunger for glory and empire rather than by statesmanship. This statue and even the head of his mummy convey a clear impression of his great pride and vitality.

Photos, Mansell

The enemy fled, according to the Egyptian account, and sent envoys to implore for peace, which was granted by the magnanimous victor. Ramses withdrew in triumph, and returned to Egypt to celebrate his glories. As a matter of fact, he had by his personal valour retrieved the disastrous blunder for which he had been personally responsible, but at a cost that made it impossible to follow up the victory, such as it was. Kadesh itself remained, as it seems, uncaptured. A Hittite version would be interesting!

Treaty that Ended the Hittite War

ACTUALLY, Ramses was so far from having broken the Hittite power that he was very soon engaged on a campaign to make good his position in southern Palestine, where the Hittites were making common cause with the foes of Egypt. It took some three years before that region was sufficiently subdued to enable him to proceed with his efforts at reconquest farther north in Naharin. The course of these wars cannot be traced with any accuracy. He is found campaigning considerably beyond Kadesh, which may imply that he captured it; on one occasion he was surprised, and was forced to fight without having time to put on his armour. He captured cities year after year, but capturing did not always mean retaining.

It all ended in Peace with Honour. Mutallis was killed—perhaps assassinated—in 1295 and his brother Hattusil, who succeeded to a probably precarious throne, proffered terms, by no means in the character of a vanquished suppliant. Peace and amity were better than an interminable war between rivals, neither of whom seemed in the least likely to achieve decisive victory. That was all. Hatti and Egypt were on an equal footing—and Egypt was quite ready.

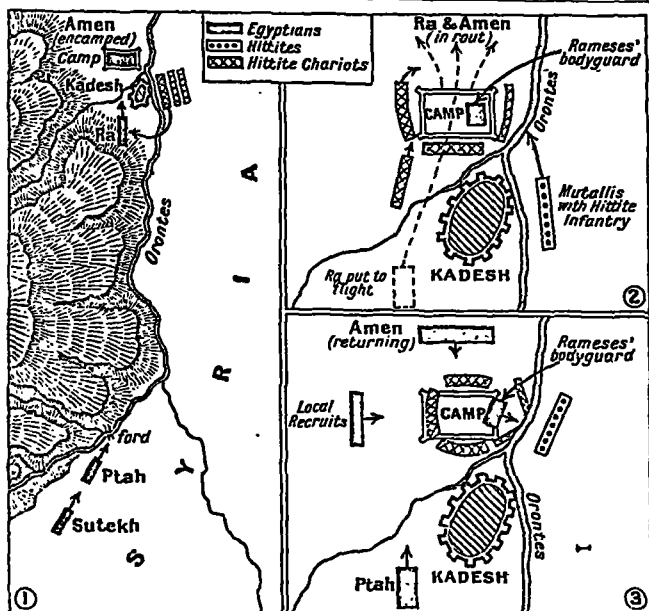
The treaty struck in the twenty-first year of Ramses II is the first instrument of the kind preserved for posterity, possibly the first to which the name 'treaty' can be applied definitely, though a treaty so called had certainly been made between Seti and Mursil, the father of Mutallis, to which, and to a previous treaty (with Horemheb), reference is

made in this instrument. Here, however, we have a formal diplomatic document—copied on the walls of Egyptian temples—of which parts, in an earlier draft, have been found in cuneiform at the Hittite capital; a regular treaty of alliance and brotherhood for ever; pledging the two potentates to abstain from aggression against each other, to make common cause against foreign aggressors and internal rebels, and mutually to hand over political offenders. And that treaty was at any rate so far faithfully observed that Hatti and Egypt were never again in arms against each other (1280 B.C.).

Some years later, *Rameses* took a daughter of *Hattusil* to wife. He had evidently had his fill of fighting, for we never hear of him on campaign again after the treaty, though he lived till 1225. His wars won him a posthumous glory out of all proportion to his military achievements, though his personal prowess is not to be questioned. With all his campaigning, the 'conqueror of the Hittites' does not appear to have won a foot of territory from them. For the peace he made with them, however, he almost deserves to be called a great man; though even for that the credit belongs more to *Hattusil* than to *Rameses*. But his unrivalled genius for advertisement is attested by his posthumous reputation. He successfully attached to his own name the honours belonging to the most distinguished of his predecessors.

Magnificence Cloaks the Empire's Decay

WHEN the lust of battle and adventure had departed from him, *Rameses* left the empire to sink into decay while its outward splendour hid the process. Long before the end—for he lived to about ninety—he had probably sunk into senile decay himself. The eldest survivor of his multitudinous offspring, *Merneptah* (who was formerly identified with the 'Pharaoh of



THREE STAGES OF THE BATTLE OF KADESH

Rameses II, with the four divisions of his army strung apart in column of route, fell into a Hittite trap (1) and had his second division cut up. Most of his own division, encamped, was carried away in the panic (2), and only his personal bodyguard sustained the battle until the arrival of the third division (3).

the Exodus'), though already an old man, made a creditable attempt at recovery, crushed revolts in Palestine, and inflicted a shattering defeat on the forces of Libyan raiders reinforced by the ominously multiplying bands of sea-rovers (1221). But on his death (c. 1215) there ensued a period of anarchy, pretender after pretender seizing the throne of the Pharaohs; until the last of Egypt's warrior kings, *Rameses* III of the Twentieth Dynasty, came to the throne after the vigorous but very brief rule of his father, *Setnekht*, in 1198.

In the latter half of the fourteenth century Mitanni had disappeared, swallowed up by Hatti. Babylon, under a young ruler, *Kurigalzu*, who had been established on the throne by the intervention of *Ashur-uballit* of Assyria, was for a time virtually a dependency of that power. But *Kurigalzu* proved vigorous; *Ashur-uballit's* successors were inactive, and Babylon recovered her independence. Neither was disposed to challenge Hatti, which was too occupied with the problem of absorbing the Syrian territories of the Egyptian Empire to turn her ambitions eastward.



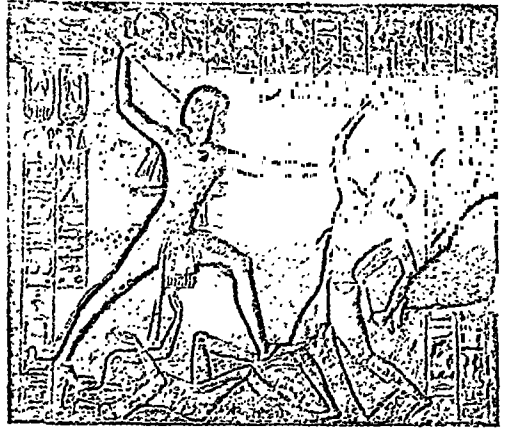
VIGOROUS REPRESENTATION OF INCIDENTS IN THE CAMPAIGNS OF THE VAINGLORIOUS RAMESES II.

In fact an indifferent general, though apparently possessing plenty of impetuous courage, Ramses II took an inordinate delight in commemorating pictorially and otherwise, the details of his conquests. Although his successes do not appear to have been considerable, the records usually take the form of scenes of victory such as are included in this mural decoration (the two strips form a continuous band in a Nubian temple). Ramses is shown seated upon his throne while Asiatic prisoners are haled before him; next are representations of him slaying a Libyan, and charging Syrian foes in his chariot. Below, he is seen capturing a Syrian fortress, and receiving more prisoners—Libyans on this occasion.

Pholas, Mansell

When Rameses II and Mutallis were in the grip of their fifteen years' struggle, Shalmaneser I of Assyria (1276-1256 B.C.) had hopes of profiting at the expense of Hatti, but still refrained from an open challenge. Any projects of aggression were dashed by the great peace. Hattusil, however, became most friendly with Babylon, which was most unfriendly with Assyria, though there was evidently a strong pro-Assyrian, anti-Hittite party there as well, while both powers were intriguing for the ascendancy. The general result was that about the middle of the century (1256) Shalmaneser's son Tukulti-Ninurta ejected the pro-Hittite king of Babylon, Kadashman-Buriash, made himself king and ruled for seven years, while the Hittite—Hattusil had died not long before—made no attempt to defend his ally.

The Hittite power was already dissolving; before the century was over it had passed away. Babylon revolted against Tukulti-Ninurta, recovered her freedom, and under her kings Meli-shipak II and Marduk-apal-iddin I is found once more holding Assyria apparently in vassalage. But after this comes chaos for a time.



PHARAOH ENGAGES HIS FOE

Rameses II's personal prowess is beyond dispute, and the active part that he played in battle is shown by this spirited relief at Abu Simbel, representing him in the act of smiting a Libyan soldier with (apparently) his lance.

The old Kassite line perishes in an Assyrian revolt early in the twelfth century; not Kassites, but a genuine native dynasty from Isin reigns in Babylon, with no sort of distinction for its first twenty-five years, while Assyria, though independent, lies under a cloud.



SUCCESSFUL EGYPTIAN CHARGE

An expression of the pride taken by Rameses II in the means by which he won the battle of Kadesh—repeated chariot charges led by himself—these reliefs in the Ramesseum show Egyptian chariots breaking the Hittite ranks.

Courtesy of Sir Flinders Petrie

WHEN the twelfth century opened, the old powers which still survived were in decline, and new forces hardly yet recognizable were coming into play; forces whose movements we can only now begin to chronicle.

For centuries past a high civilization had existed among the islanders of the eastern Mediterranean, having its principal centre in Crete; it is conveniently known as Minoan. There had been much commercial intercourse with Egypt, but no definite political relations, and the annals of this maritime power cannot as yet be traced out.

It had extended its penetration to the coasts of the Aegean, till its primacy had passed from Cnossus to its offshoot Mycenae on the Greek mainland; but at the end of the thirteenth century it was being, or had already been, absorbed by the advance of Hellenic peoples, who spread through Greece and the islands, and presently penetrated the coastlands of Asia Minor. These folk we know under the name of the Achaeans from

the Homeric sagas, the Iliad and the Odyssey; and their advent as conquerors or dynasty founders from the north, or at least from the north of Greece, now seems unquestionable. Whether they were the first 'Greeks' in Greece—indeed, whether they themselves were by origin 'Greeks' at all—is another question; but it is on the whole probable that the bulk of the people over whom the Minoan dynasts had ruled were already Hellenic in speech. In any case, rigid uniformity of opinion on such an open question is not desirable, and in the following chapters views of the different

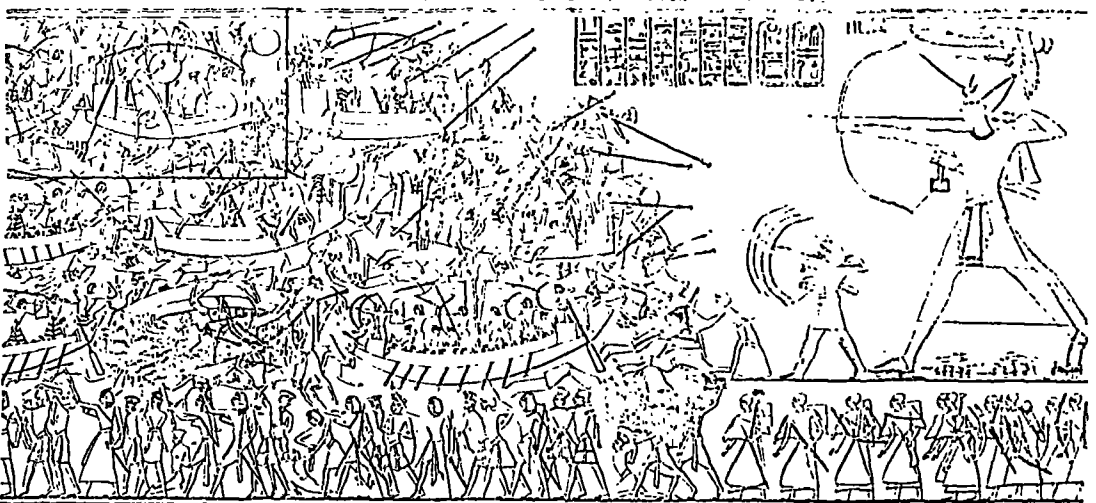
authorities will be found expressed, with the arguments for each.

Kindred but not actually Hellenic peoples, inclusively known as Phrygians, had already entered Asia Minor from the west, crossing the Hellespont. The undoubtedly historical siege of the city of Troy, probably about the beginning of the twelfth century, marks a stage in the contest between the expanding (Hellenic) Achaeans and the already established Phrygians, using the latter term in its widest sense.

This Greek or Hellenic expansion in the Aegean, and the Phrygian pressure in

Asia Minor, forced upon the earlier dwellers in those regions movements which from this time bring them more and more into collision with the peoples that have hitherto monopolised the stage.

Such a movement was now taking place on a large scale. These peoples of Asia



HARD-FOUGHT NAVAL BATTLE THAT RESULTED IN AN EGYPTIAN VICTORY

The onslaughts of the so-called 'Peoples of the Sea,' among whom were the Achaeans, the Danaans and the Philistines, were met and repulsed by the last great warrior-Pharaoh, Rameses III. He defeated them on land and sea, and carvings at Medinet Habu record one of his triumphs, constituting the earliest historic representation of a naval engagement known. The drawing (bottom) shows the minute details of part of this remarkable historical record and above is a photograph of the rectangular portion of the carving marked in the drawing.

Photo, Mansell

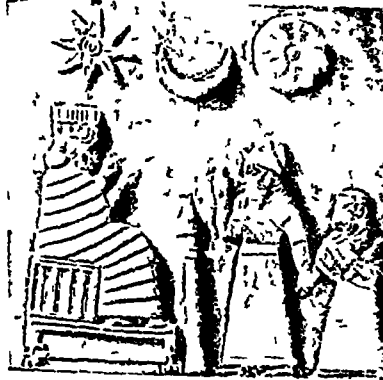
Minor, the 'Northmen' of the ancient world, had already for generations been sending out rover bands which vexed the coasts of Egypt, but also provided the Egyptian armies with mercenary troops of professional fighting-men, the Shirdanu, who had become a regular part of the military establishment. A bigger movement had been heralded when a great pirate host joined with the Libyans, to be heavily repulsed by Merneptah (see above). Migratory bands from the west had probably much to do with the rapid decay of the Hittite power. These things were the precursors of the great Irruption of the Northmen.

Rameses III (1198-1167 B.C.) was king of Egypt when the storm broke. A great confederate host of the 'Peoples of the Sea,' among whom, besides the Shirdanu, who would have to fight their own kinsmen in the Egyptian armies, and the Pulasati (Philistines), we can now detect the names of Achaeans and Danaans as well, swooped upon the Delta, the Libyans joining them. Rameses met them in 1190 and smote them in a great fight by land and sea, but the peril was not yet over. The defeated fleet was only an advance force. The migrant hordes were even now streaming into Syria.

Last Hour of Glory of the Fading Empire

IRAMULES was equal to the emergency. Somewhere on the Palestine coast he again caught and smote them by land and sea—a blow so shattering that Egypt was never again molested by them. The wars of Rameses III against the Peoples of the Sea have given us our first historic picture of a naval battle. Once more he had to draw the sword, and with decisive effect, but it was against a western enemy, the Meshwesh, Berber tribes from beyond Libya who dreamed of an Egyptian conquest, but were utterly put to rout.

Rameses III delivered Egypt from the barbarian onslaught, but, gallant and skilful soldier though he was, he could not save her from herself. It was her last



ROYAL HOMAGE TO DIVINITY
Meli-shupak II maintained the independence of Babylon after its revolt from the Assyrian domination imposed by Tukulti-Ninurta. On this boundary stone he is shown with his daughter before the goddess Nanā.
From J. de Morgan 'Délégation en Perse'

hour of glory. She was freed from foreign attack, but the rule of the land had passed into the hands of an organized priesthood of the most ruinous type. Rameses followed Rameses on the throne, each vying with his predecessor in the lavishness of his temple endowments, careless of aught else, till, in about 1094 B.C., Her-Heru or Hrihoi, the high priest of Amen, assumed the title of Pharaoh, and the monarchy (Twenty-first Dynasty) became little more than a name.

To this period of the Ramesids belongs the development of a practice familiar in the histories of later Oriental (especially Mahomedan) dynasties, but ascribed by the Hebrew story of the Exodus to a much earlier period: the practice of bestowing the highest offices of the state, the court and the army on slaves. Joseph's 'chief butler' has a Ramesid office and title, probably imported into the tradition in later days.

In Asia the Egyptian sovereignty hardly survived even in name. The great victory of Rameses III did not prevent the Philistines from settling upon and mastering at least the plains of southern Palestine, where we find them at perpetual feud with the 'judges' of Israel, whose principal foes after the conquest had been the still active Syrian Amorites and Midianites. Even in her palmiest days Egypt had exercised little enough control over the tribal feuds of her Asiatic subjects, so long as they did not interfere with the payment of tribute. Under the Ramesids there was no control at all, and in Phoenicia Egyptian commissioners found their authority politely but uncompromisingly repudiated.

Syria then—using that term in its widest signification as covering the region

from the Euphrates to the peninsula of Sinai—now recognized no power as exercising sovereign authority. Beyond the Euphrates the sovereignty was divided between Assyria and Babylon, which collided whenever there arose in either a more than usually aggressive monarch; while Babylon, as of old, was subjected to occasional attacks from Elam.

The third ruler of the Isin dynasty, Nebuchadrezzar I (1146-1122 B.C.), was the first who displayed any marked energy. He inflicted severe chastisement on Elam, but suffered defeat in a conflict with the Assyrian Ashur-resh-ishi, who was probably the aggressor. Both powers were perhaps laying claim to Amorite territory once subject to the Hittites, as the battle was fought in this region (c. 1125).

The son of Ashur-resh-ishi, Tiglath-pileser I, then embarked on a career of conquest. Twice he entered Babylon itself, now ruled by Marduk-nadin-akhe (d. 1100), the last Isin king of any vigour; he assumed the old title of 'king of Sumer and Akkad'; he seized all the western territories claimed by Babylon, and as much as still remained of the old Hittite dominion; he even penetrated the Taurus and hammered the former land of Hatti itself, claiming to have carried his conquest as far as the shores of the Black Sea; he asserted his sovereignty, which was promptly acknowledged, over the Phœnician cities.

Babylon and Elam, which had snatched at the opportunity for attack while he was engaged in the west, next felt the weight of his hand before his brief but exceedingly vigorous thirteen years' reign ended in 1102. But he was not the founder of an Assyrian empire. For more than the next hundred years incompetent and lethargic monarchs or dynasties ruled or did not rule obscurely in Assyria and Babylonia.

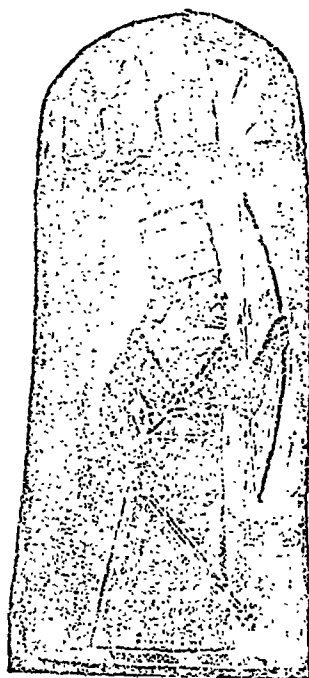
Nor did Egypt fare any better under the nominal government of sacerdotal Pharaohs, while a Libyan 'peaceful penetration' dominated the Delta, Nubians dominated the south and the troops for the most part consisted of foreign, especially Libyan, mercenaries.

Upheavals in the Syrian Area

DURING this paralysis of Egypt and Mesopotamia states were rising and falling in the great Syrian area, now set free from their long domination. The maritime cities of Phœnicia waxed in wealth, each under her own king, not seeking dominion but gathering commercial spoils from distant shores. There was no prospect of a Syrian empire arising, because the utmost unity attainable was that of a league between independent cities and tribes; and though such leagues might be formed readily enough for defensive purposes in the face of a common danger, aggressive combinations inevitably dissolved as soon as the individual members found their special interests clashing or saw any one among them acquiring predominance, or suffered any disastrous defeat.

The Philistine league, however, had established itself as a union of city states on the plain of southern Palestine, to which they gave their own name, Pulasati, permanently; subjecting the Canaanites, or driving the most unsubduable of them, the tribes of Israel, into the hills. Presently they set about a serious attempt to conquer the hill-men, whose tribes scarcely possessed a common organization, though they had a bond of union in their unique religion and their tribal traditions.

Realization of the imperative need for a unity, attainable only through a supreme military chief, led the Hebrew clans to elect the Benjamite Saul as king; Saul led them



KING OF BABYLON

Profiting perhaps by the absence of its ruler, Tiglath-pileser I, on a campaign, King Marduk-nadin-akhe of Babylon raided Assyria.

British Museum

to battle and won a great victory at Michmash, which drove the oppressor back to his own cities. The new war-chief was able to turn on the Amalekites, southern tribes with which Israel had been at constant feud, and crush them.

The Philistines, however, were not minded to retire after one rebuff. The war was renewed; Saul had not established national unity; the king was alarmed by the popularity of his most brilliant lieutenant, David, whose loyalty he repaid by treating him as a rebel. Deprived of his aid, Saul met his death in a heavy defeat at the hands of the Philistines at Mount Gilboa. But Israel rallied to David as the one possible saviour, though the succession was disputed by a rival faction; and under David's leadership the supremacy of the Hebrew kingdom was decisively established, the Philistine power was shattered and the hostile encircling tribes were forced to become David's tributaries (c. 1000 B.C.). The reconstruction of these early historical events from the Biblical narrative is most difficult, and further reference should be sought in Chapter 27.

Less than half a century of constant warfare had welded the Hebrew tribes together and made Israel into the greatest territorial power in the Syrian area. David's son Solomon, like his Phoenician neighbours, with whom he was on the best of terms, sought not imperial expansion but material wealth; and the wealth accumulated under his long rule has become proverbial.

Disintegration of the Hebrew Kingdom

IN the third generation, however (c. 935), the Hebrew kingdom broke up. The royal house of the south, closely associated as it was with the theocratic idea, had never commanded the unqualified allegiance of the north; it broke away from the feeble Rehoboam under the leadership of Jeroboam, a military chief who assumed the crown of Israel. The south, however, remained loyal to the house of David as the kingdom of Judah; less powerful but less exposed to aggression and to external decadent influences than the northern kingdom, and consequently destined to a longer independence and a less hopelessly disastrous ultimate downfall.

Meanwhile, something like a recovery took place in Egypt, where the Libyan Shashank (Shishak) established his supremacy and in 947 inaugurated the Twenty-second Dynasty; making his authority felt with such effect that on the disruption of Israel he was able to assert his nominal sovereignty so far as to invade Palestine and carry off considerable spoils; though there was little prospect of Egypt reappearing as an imperial power.

Much more ominous were the signs that Assyria was on the point of throwing off her long lethargy with the accession of Adad-nirari II in 911 B.C.; a definite date which marks for the historians a new era by the Assyrian institution of an official chronicle in which events were recorded year by year, so that from this time it is possible to speak with unwonted precision.

Movements of the New Peoples

FINALLY, we must glance at the new ingredients in the melting-pot. No exact chronicles can be given of the movements of those northern peoples who are beginning to come within our ken, but something may be recorded.

By the eleventh century the Hellenic expansion had mastered the islands of the Aegean, and was making 'Aeolic' settlements on the coast of Asia Minor. In the century that followed there came from the north the migration or invasion of the last great group of Hellenes, the Dorians; as yet comparatively barbarous, but armed with the iron weapons which placed them at an advantage in conflicts with their bronze-bearing precursors. They were thus enabled to secure their supremacy in the Peloponnese and in Crete, and to penetrate Asia Minor; where they did not so much displace the native populations as provide the states with dynasts of Dorian ancestry.

The eastward movement in Asia Minor corresponding to the pressure from the west was gradually consolidating in the centre a Phrygian power, soon to be known in the east as Mushki. Beyond the mountains, whence in an earlier day had issued Gutians and Kassites, Iranians were massing in Media. The new peoples were not yet known as powers, but they had entered the stage.



The two seated pieces—the mother of Thothmes III and a Nineteenth Dynasty state official with his wife—are chiefly of interest as showing styles of clothing. The prosperity of the Empire brought with it a fashion for fine linen from neck to ankle instead of the kirtle of earlier days; while the wigs were truly 'full-bottomed.' Right, an Eighteenth Dynasty statuette in wood.



To certain minds there is something thoroughly unsatisfactory about Egyptian art during the Empire—mere prettiness without the strength of the Old Kingdom or the refined eclecticism of the later Saite period. The sculpture above, though not free from these defects, should correct such a sweeping condemnation—especially the sharply-characterised head of Queen Tiye (right). To the left of it is a squatting figure of the vizier of Rameses II, and a bust of a priestess.

WHAT THE SCULPTOR'S WORKSHOP PRODUCED IN THE DAYS OF THE EMPIRE

British and Berlin Museums (top); Egypt Exploration Society, Boston Museum and Sir Flinders Petrie (bottom)

THE EGYPTIAN EMPIRE: ITS SPLENDOUR AND DECLINE

Life and Art during the Centuries in which
Egypt won and lost her Imperial Dominion

By F. LLEWELLYN GRIFFITH LL.D. F.B.A.

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THE period which we now have under consideration witnessed in Egypt two outstanding phenomena: the formation of the first empire of which we have certain record, and the religious revolution of Akhnaton, which will be discussed in Chapter 24.

Empire is, of course, a relative term in this connexion; an empire hardly differs in kind but only in degree from a kingdom, which may be of any size from a few villages upwards and may, like a typical empire, be far from homogeneous. In the Eighteenth Dynasty we see the kings of Egypt not merely overrunning a large area in two continents, but also inducing the conquered lands to acknowledge their rule for a long time and pay them tribute. From his capital at Thebes at the height of the Egyptian power the Pharaoh expected his commands to be obeyed by the dusky and barbaric princes of Cush as far away as the Fourth Cataract, distant eight hundred miles along the course of the Nile, and by pale Syrian kinglets north-eastwards more than a thousand miles to the Euphrates; this we may fairly call Empire.

After the Cushite kingdom, centred at Kerma just beyond the Third Cataract, had been finally crushed by Amenhotep I, for some six hundred years the Nubian territory from the Egyptian frontier at the First Cataract southwards was governed by an Egyptian viceroy entitled 'Son of the King of Cush,' and was largely administered by Egyptian officials. Though military expeditions from Egypt were occasionally necessary, all the land paid tribute to the viceroy, who forwarded the results to Egypt—tribute of gold,

elephant-ivory, ebony, leopard skins, slaves and cattle, as well as strange and rare animals, such as giraffes and monkeys, to amuse Pharaoh and his great men.

The mixed Egyptian-and-Nubian civilization and industries of Kerma were at once annihilated. Temples were built or burrowed out of the solid rock to the Egyptian deities and to the reigning Pharaoh, and two of the proudest builders among the Pharaohs dedicated each a temple in Nubia to his favourite queen—Amenhotep III at Sedeinga to Tiye, and Rameses II at Abu-Simbel, by the side of State of Nubia his own vast temple, to under the Empire Nefertari. But all the monuments are purely Egyptian, and so low was the vital energy of the natives that from the time when the resources of the Empire declined, though no more Egyptian monuments were built, aboriginal relics are as completely absent as in the great days of the Empire.

Such was the Empire in Nubia, suppressing the feeble native culture, Egyptianising the land and enriching Egypt with its products and its traffic. Of the Empire in the western or Libyan desert we know little. It must have included the nearer oases, which naturally belong to Egypt; but the Libyan side could yield little that would interest the Pharaohs. On the other hand, the wandering tribes were a menace to the Nile dwellers in times of weakness.

Much the same may be said of the eastern side; but here the land was richer and gold was comparatively plentiful. The Pharaohs also needed to keep open the routes to the ports on the Red Sea, whence ships sailed to collect frankin-

cense and other choice gums, the products of the land of Punt. Punt was a wide term, and seems to have included both the African coast of Abyssinia and Somaliland and the trading ports of South Arabia; the expedition which Queen Hatshepsut sent to Punt is celebrated in the sculptures of her temple at Deir el-Bahri.

The Sinai peninsula had an attraction for the Pharaohs at two points: first the mines of malachite, turquoise and copper situated about ten to fifteen miles from the middle of the western coast, at Serabit and Magharah; secondly the road along

the Mediterranean sea-board which led from the Egyptian frontier fortress of Zaru into Palestine.

This brings us to the Empire in the north-east, in Asia. After the Hyksos had been crushed, the small and disconnected communities of Syria under Palestine and Syria had Egyptian rule little force to oppose to the trained soldiers of the Pharaohs; Amenhotep I and Thothmes (Thutmose) I successively marched as far as the Euphrates, the limit of the Empire in later days. The peaceful reigns of Thothmes II and Hatshepsut gave the Syrians an opportunity to organize, and the city of Kadesh seated in the broad valley of the Orontes, commanding the roads from Egypt and from the Phoenician coast, became the centre of united opposition to Egyptian interference. Thothmes III had to proceed in a series of annual campaigns to crush this confederacy and secure his hold on Palestine and Syria.

In the first campaign he captured Megiddo, but five more were necessary before he could seize Kadesh itself; at length in the eighth campaign he reached the Euphrates, took Carchemish and set up a tablet on the east bank of the great river by the side of that which his father or grandfather Thothmes I had engraved. Yet eight more campaigns were necessary to consolidate his conquests and inspire the surrounding peoples with terror of his strong arm. His army was always ready to march, and the ports on the Phoenician coast were always supplied with equipment and provisions so that any hostile move could be speedily visited with punishment.

These northern peoples, capable of high civilization, were allowed to retain their native rulers under the Empire, as the Cushites retained their chiefs; but their sons were brought to Egypt as hostages for good behaviour and carefully educated so that when the father died the son might return to take his place and govern his city and territory as an Egyptianised subject of Pharaoh. Thothmes III was the true builder of the Empire, originating this system by which the princes of Syria were taught in Egypt to realize the superiority and might of Pharaoh and to rule their principedoms as loyal subjects,



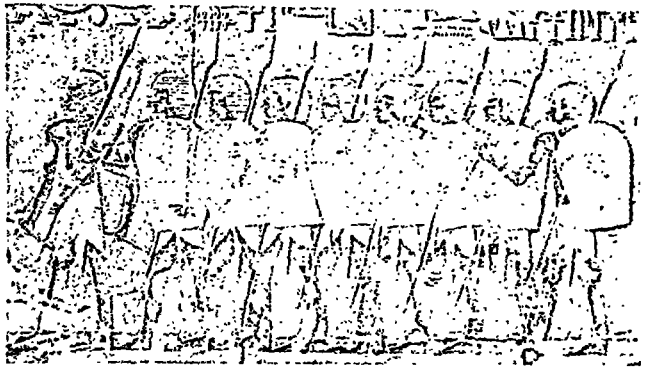
EMPIRE RULED BY THE PHARAOHS

From the Fourth Cataract in the south to the banks of the Euphrates Pharaoh's word was law during the heyday of the Egyptian Empire in the Eighteenth Dynasty; but while Nubia was absorbed entire, Syria retained its native princes.

paying their tribute and looking to him for protection against enemies both great and small.

This principle once established was doubtless followed while the Egyptian Empire lasted, and served admirably so long as Egypt kept the everlasting intrigues under control and gave active support to faithful vassals. At least one punitive expedition was necessary at the beginning of each new reign till Amenhotep III succeeded to magnificent peace, apparently without a struggle, his empire holding together through long custom and the steady working of the original system. With Akhnaton's neglect the rule in Asia collapsed utterly. It slowly revived again, especially with the energetic action of Rameses II against the Hittites and his final alliance with them; but after that time, Egypt was merely one of several claimants and aspirants to rule or raid in Palestine and Syria and, doubtless, a leading element in local intrigues.

The backbone of the Egyptian population at this period, as always, was the toiling fellah of the fields, raising corn and other crops, together with cattle and geese and



TROOPS THAT WON EGYPT HER EMPIRE

A section of infantry under the command of an officer—part of Hatshepsut's expedition to Punt as sculptured in her temple at Deir el-Bahri—is typical of the native Egyptian levies before they became displaced by mercenary troops. Spear, small battle-axe and shield complete their equipment.

Courtesy of Egypt Exploration Society

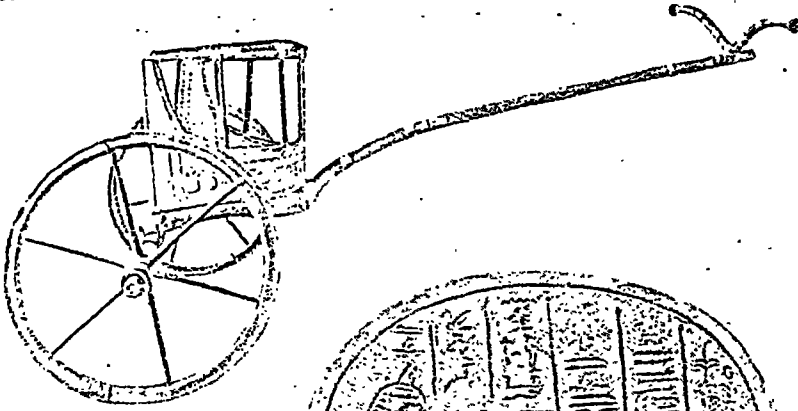
ducks, upon the teeming alluvium of the Nile. A tiller of the soil, he loved his own land and hated to be away from it, more particularly on military service. Yet the army that made the Empire consisted of Egyptians fired with hatred of the Hyksos and with enthusiasm for their victorious leaders. For the first time Egypt possessed a large standing army under the direct orders of the king, divided into regiments and systematically armed and officered. There were sundry improvements in their equipment over the older levies. Their spearheads and



HOW THE NATIVES OF NUBIA WERE CIVILIZED BY THEIR MIGHTY NEIGHBOUR

A fresco in the tomb at Tell el-Amarna of Huy, vizier to Tutankhamen, emphasises the complete dependence of Nubia upon Egypt. The figures who are depicted coming to pay homage to Pharaoh are native Nubians, as their negroid cast of features indicates; but in all other respects—clothing, sandals, collars, chariot—they have become completely Egyptianised; only the draught-oxen and a certain barbarity of ornament—ostrich feathers, for instance—strike a foreign note

From A. H. Gardiner, Tomb of Huy



daggers were of bronze instead of copper, their arrowheads of bronze instead of flint, and even iron was occasionally seen in the hands of their officers. The war chariots, too, each drawn by two horses, now formed an important section of every army.

But after the first century and a half the enthusiasm for war diminished and the places of the Egyptians were taken by foreign mercenaries, recruited especially from the 'Peoples of the Sea,' dwellers on the coasts and islands of the



CHARIOTS PICTORIAL AND REAL

A good representation of the Egyptian chariot in use is given on this stele from Tell el-Amarna. Actual specimens also exist, such as that of Iuaa (top), the grandfather of Akhnaton.

From Davis, 'Tomb of Iouiya,' and Davies, 'Rock Tombs of El Amarna' (Egypt Exploration Society)

Mediterranean, and from the western neighbours of the Egyptians, the Libyan peoples. These mercenaries found Egypt a goodly land to settle in, and their chiefs acquired or seized estates in the Delta and elsewhere. Sometimes the cry was raised to eject them, and Merneptah of the Nineteenth Dynasty won much glory by doing so with the help of other mercenaries; but as the Egyptian government weakened, the soldiers became stronger, and it was apparently Libyan chiefs who were the ancestors of most of the ruling dynasties after the Twentieth.

That Egyptian ships accustomed to fighting on the Nile could also overcome their enemies of the

Peoples of the Sea on their own element, is shown by the representations of a sea-fight in the time of Rameses III (see page 674). In it we see Egyptian archers from ships and shore destroying their enemies the Philistines, who are armed only for close combat.

The lot of the common soldier, exiled from his beloved Egypt and constantly in trouble with the enemy and with his own superiors, was a hard one. The higher officers, on the other hand, were expected to use their own intelligence and must have found their experiences abroad full of interest. Many must not only have learnt the geography and the military features of the lands they traversed, but also have acquired a considerable knowledge of their natural products, their arts and crafts and the languages spoken by the inhabitants.



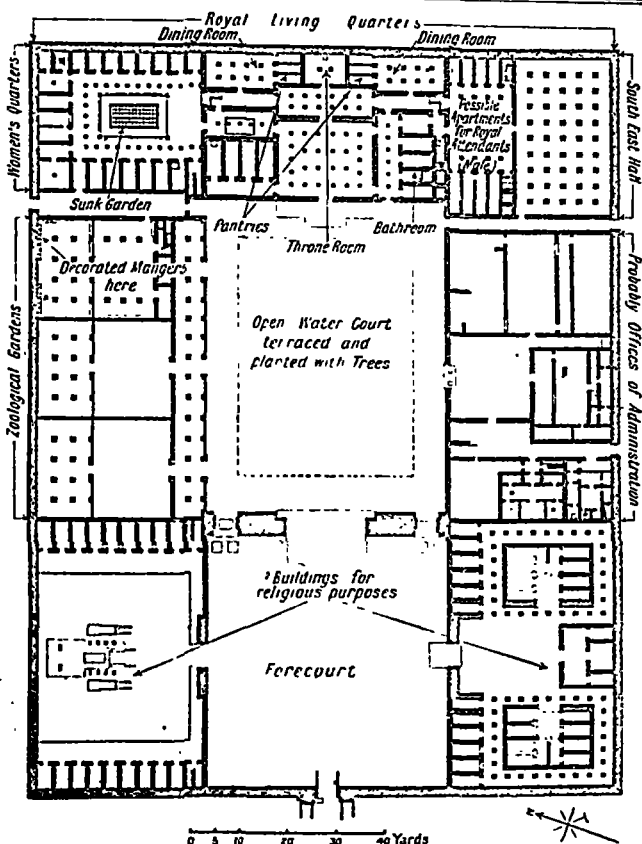
SCENE IN EGYPT'S 'FARTHEST SOUTH'

The sort of country which Hatshepsut's expedition found leaves no doubt that Punt must have been at least as far south as Somaliland. Note the typical negro hut, dome-shaped and standing on a pile platform reached by a ladder.

From Schäfer, 'Kunst des Alten Orients'

Thothmes III caused drawings to be made of the strange plants of the north-east, and these were afterwards reproduced in sculpture on the walls of a chamber in the temple of Karnak; unfortunately they are so vague and so much conventionalised that few can be identified with any certainty. Examples of the domestic fowl 'which laid an egg every day' were brought home by him from Mesopotamia as a wonder; but they remained a rarity in Egypt until after the close of the period of which we are treating. The Hyksos rule had conferred at least one benefit on the country, although this touched chiefly the wealthy classes—it had introduced the horse and chariot into Egypt. The horse was rarely ridden, nor was it used as a beast of burden like the ass. We see it in pictures in the stable or in the chariot, and the chariot carried the great men of Egypt round their estates as well as into battle. The camel was still practically unknown.

Tell el-Amarna offers the only comprehensive illustration of how a great city was



PLAN OF PALACE FOR THE HERETIC KING

In Akhetaton, the city that he built for himself at Tell-el-Amarna, Akhnaton had no fewer than three palaces. This is a plan of the northernmost, slightly restored but mostly attested by the actual foundations. Note how it differs, in its orderly arrangement, from the labyrinthine Cretan palaces.

From 'City of Akhenaten,' Egypt Exploration Society



EARLIEST DRAWING OF A COCK

Not until Thothmes III brought some back from one of his Syrian campaigns was there any knowledge of domestic fowls in Egypt. This, the earliest known drawing of a cock, comes from an Eighteenth Dynasty tomb.

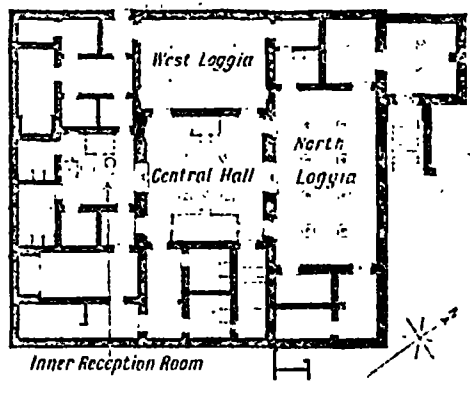
British Museum, Natural History

laid out by the Egyptians in the time of the Empire. Here we have the ruins of the royal city itself, hastily built by Akhnaton, and hastily deserted as the result of revolution after a brief but vigorous existence. Here, as nowhere else in Egypt, we can trace clearly the plans of its palaces, houses and villas over a large part of the site. They were built in mere sun-dried brick and so have survived. The materials of its temples were, unfortunately, too valuable to be left to natural decay; they were rooted out and have left little to explain to us the disposition of their halls and shrines.

The site chosen by Akhnaton for his new capital, named Akhetaton, was on the east bank of the Nile with a narrow fringe of cultivated land in front and a broad



Here are seen the pillar-bases of the North Loggia. Its mud-brick walls were whitewashed, but relieved by a frieze of blue lotus petals on a green ground surmounted by a red band. Indeed the walls throughout were plain, but stone door-jambs were often picked out in brilliant colours.



The roof of the Central Hall in Nakht's house was supported on four wooden columns, whose stone bases are still in position, and fragments show that it was painted a vivid blue. A brick divan occupied most of one wall, with a stone slab for lustrations in the wall opposite.



Largest of the private houses at Akhetaton, but still far behind those of the king in size, the residence of the vizier Nakht is sufficiently preserved for a reconstruction of one of its rooms to be made (centre left), with the aid of the debris from the upper parts of the walls. With the exception of the North Loggia, the Central Hall and the Inner Reception Room (shown above), which seem to have risen to roof-level, it may very likely have been of two storeys.

MANSION OF A PHARAOH'S VIZIER AND ONE OF ITS ROOMS RESTORED

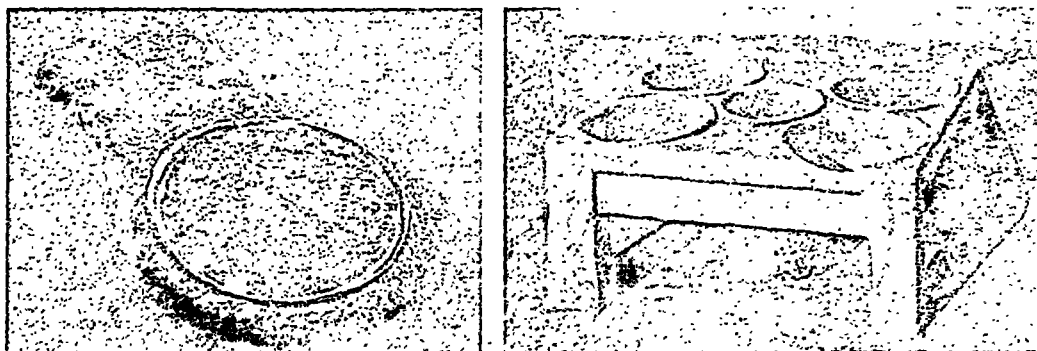
From 'The City of Akhetaten,' Egypt Exploration Society



The granaries at Akhetaton were circular brick bins sunk slightly in the ground, probably domed and with a hole in the roof. The stone seats on the right came from the workmen's village (see page 687), and are surprisingly comfortable—especially the lower one, standing on three short legs.



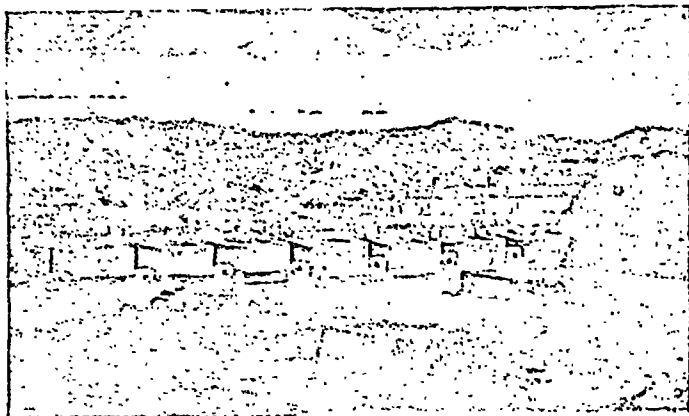
Most of the prosperous houses in Akhetaton had their bathroom (right); they contained what was not so much a bath as a stone slab on which the master stood while a slave poured water over him. The water escaped by a runnel into a sump from which it was afterwards baled. Left, a drain.



Much of the private life in Akhetaton can be deduced from an examination of the private houses, and one can often tell the uses of particular rooms by their contents. In the living rooms there would be a circular depression for a brazier, which was sometimes portable, sometimes, as in the example on the left, cemented in place; the fuel was usually charcoal. In the central hall there might be a stand to hold jars of water (right), for drinking as well as for washing hands and feet.

DETAILS OF THE PRIVATE ECONOMY OF EGYPTIAN DWELLING HOUSES

From 'The City of Akhetaten,' Egypt Exploration Society



stretch of rich fields across the river. Begun in the king's sixth year, the new city sprang up rapidly; palaces, temples, government offices, workshops, villas and meaner dwellings grew apace, with three broad chariot roads curving parallel to the river, and narrow, winding, cross alleys; a broad

open area in the middle of the front penetrated far into the city from the river and served as a market place. The city bordered the cultivated area for about two miles at the outer edge of a deep desert bay in the limestone hills six



ART IN ROYAL STABLES

In the stables of the northern palace at Akhetaton (top) each of the stone mangers was decorated with incised designs of animals feeding or being herded. This example shows two ibexes.

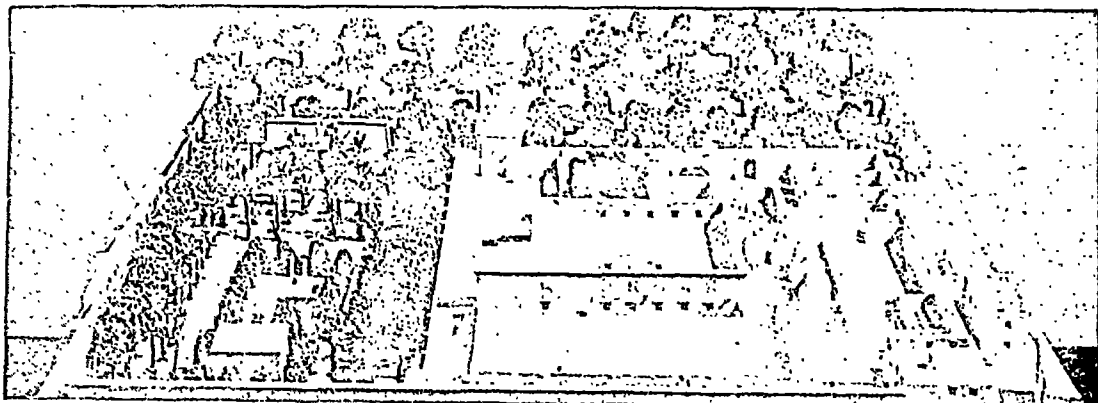
Courtesy of Egypt Exploration Society

miles wide; along the top of the cliffs were patrol paths and guard houses, and at either end of the bay, where the cliffs almost reached the Nile, were small settlements of several houses guarding the approaches by land and water.

For the king there were three palaces. The principal one was at the north end of the city; the other two were isolated at points halfway be-

tween the city itself and the north and south ends of the bay respectively. The north end of the city was monopolised by state buildings. The great palace lay between the main road and the river; on the east side of the road the enormous enclosure of the chief Aton temple bounded the city on the north, and opposite the palace lay

the offices and archives of the government and a second temple. One of the archive chambers still contained, when found in 1886, the famous cuneiform 'letters of Tell el-Amarna' addressed to Pharaoh by the governors in Syria and



GARDEN, GRANARIES AND SHADY AVENUES OF A NOBLEMAN'S DOMAIN

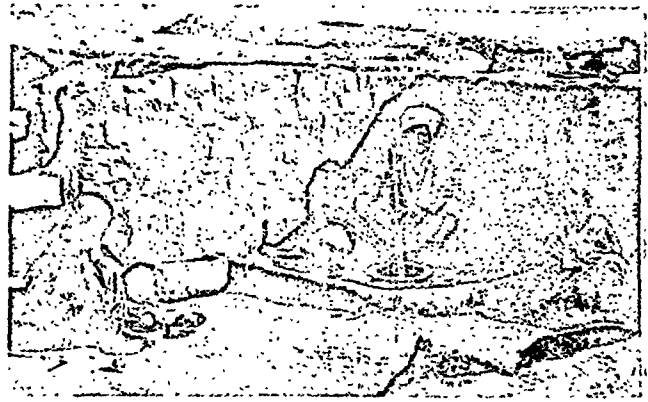
Akhetaton stretched from the river's edge well into the desert; but the Egyptian noble could not forego his pleasure-garden, so ponds were dug within his walled enclosure, trees planted each in its own little pit of specially imported earth, and beds for flowers and vegetables neatly laid out in the grounds. This model shows the lay-out of a typical estate—note the domed granaries. The multiplication of similar large residences must have made Akhetaton a veritable garden city.

Courtesy of the Berlin Museum

Palestine and the great kings of Babylonia, Assyria and Mitanni.

Apart from this it is difficult to detect any logical grouping. The house of the prime minister, or vizier, a fine mansion of thirty rooms, was situated at the opposite end of the city from the great palace, perhaps intentionally; those of other great officials were scattered up and down, both on the outskirts and in the crowded parts of the town, and the house of Pa-wah, the Chief Priest of the Aton, lay nearly two miles away from the chief temple. A great corn store was built in the desert just east of the town near the south end.

Tombs were prepared in the cliffs at two points far behind the city, and on a desert slope between were built tomb-chapels for funerary services. In strong contrast to the confused growth of the town of Akhetaton, a substantial village near these chapels was laid out with military precision for the workmen and guards of the whole necropolis. Seventy-two little houses of four rooms each, almost exactly alike and compactly grouped in straight streets, held the men and their families, besides one larger house of nine rooms for their superintendent, and an

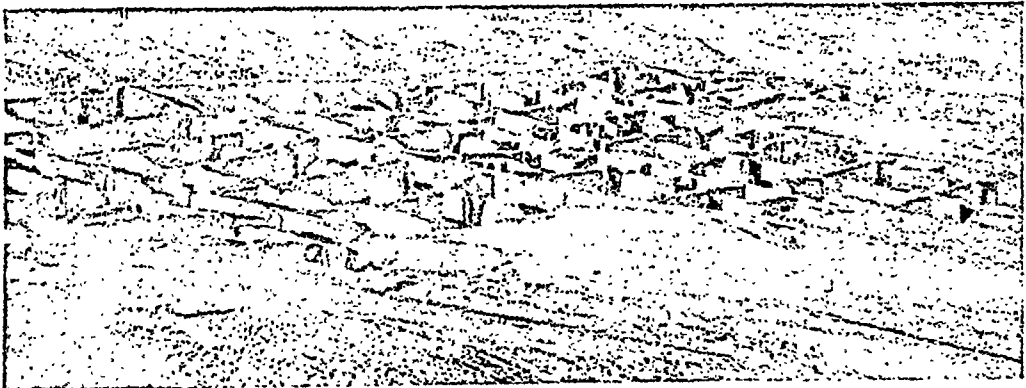


READY FOR USE AFTER 3,300 YEARS

In the workmen's village the debris of daily life came to light in great profusion. These modern Egyptians are using nothing that is not ancient in the attempt to recreate the past: charcoal pounder, mortar and wooden pestle for grain, floor-besom—even the charcoal and the grain themselves!

open place for animals. All was contained within a strong square enclosure wall, easily surveyed by patrols. Evidently the men were subject to strict discipline, as befitted those who were entrusted with the secrets of the tombs in which kings and great ones of the court were to be laid amidst priceless furnishings.

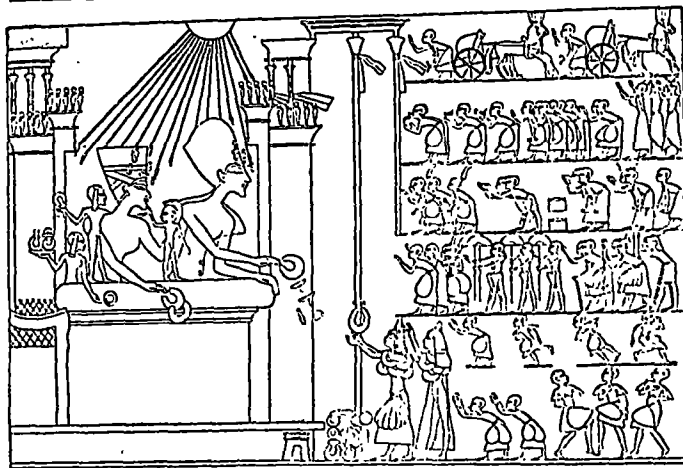
The lot of these people cannot have been a very happy one. In summer the heat must have been oppressive, there was no green thing to relieve the eye, and even the water supply must have been far distant. But the men could not escape; the site was central for their work, and their houses were not without amenities.



WHERE DWELT THE WORKMEN WHO QUARRIED TOMBS FOR HIGH-BORN EGYPTIANS

Far out towards the cliffs that contained the rock tombs of Akhetaton's noblemen lay the village of the workmen who quarried them. It was a barrack-like place enclosed within a strong wall—the quarrymen were rough folk who needed guarding—but the houses, in spite of their smallness and uniformity of plan, were not uncomfortable. They contained four rooms—front room (shared with domestic animals), living-room, bedroom and kitchen—and a staircase leading to the roof.

From 'The City of Akhetaten,' Egypt Exploration Society



PHARAOH APPEARS BEFORE HIS PEOPLE

It had been the custom for an Egyptian king to give audience throned like a god in a reception hall. Amenhotep III introduced the more intimate practice of sometimes appearing on a balcony with his family, and his son Akhnaton, seen above with his queen, adopted it as the regular court routine.

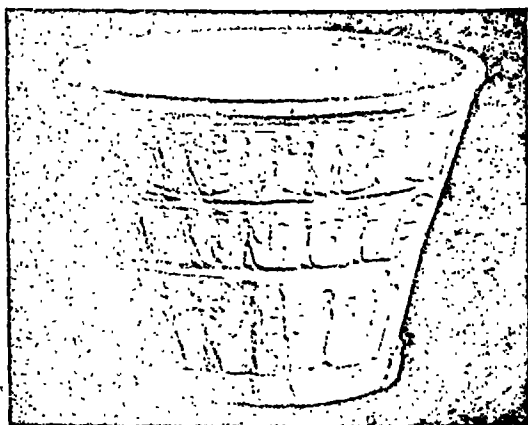
From Davies, 'Rock Tombs of El Amarna'

At Thebes the corresponding settlement of workmen of the necropolis was better situated, on the rocky slopes above the cultivation at Deir el-Medina but within easy reach of well water and close to magnificent temples and groves of pleasant trees. In the flourishing time of the Empire the workmen—stone-cutters, masons, painters, makers of funerary furniture in all its variety, and embalmers of the dead—were all extremely prosperous; but hard times came when Egypt, under the weaklings of the Twentieth Dynasty, no longer received the tribute of foreign nations and the land was impoverished by bad government. The royal treasury and granaries were empty; discontented or even starving, the crowd at times would break out and refuse to work until corn was forthcoming.

The palaces in their great enclosures comprised pools or lakes, groves of trees and various buildings. Kiosks and shrines, stables, stalls and kennels for the domestic animals can be more or less dimly recognized amongst the subsidiaries. The materials used were principally crude brick, while doorways and other details were of stone. The harem, or women's quarters, formed a separate part of each palace, with a special access from the private apartments of the king, and was more elegantly decorated with paintings on the walls and floors than the rest.

From scenes depicted in the Theban tombs we learn that Pharaoh at an earlier date gave audience on great occasions or received tribute enthroned like a god in a shrine, probably in an open court or great hall; but Amenhotep III introduced a change into the procedure. In addition to the hall of audience he utilised the great loggia windows or balconies which looked out over the courtyards. At one of these, according to the season, he made his semi-public appearance on great occasions, standing there or leaning out to inspect the gifts of embassies and receive the homage of subject princes, or to distribute rewards in collars, armlets and even gloves of massy gold to favoured officers. This became the established custom with Akhnaton (who characteristically leaned out on cushions, surrounded by his family) and all succeeding kings. Both early and late it was the regular custom to sculpture, paint or encrust symbolic figures of foreign nations prostrate or bound beneath the seat and the footstool of His Majesty.

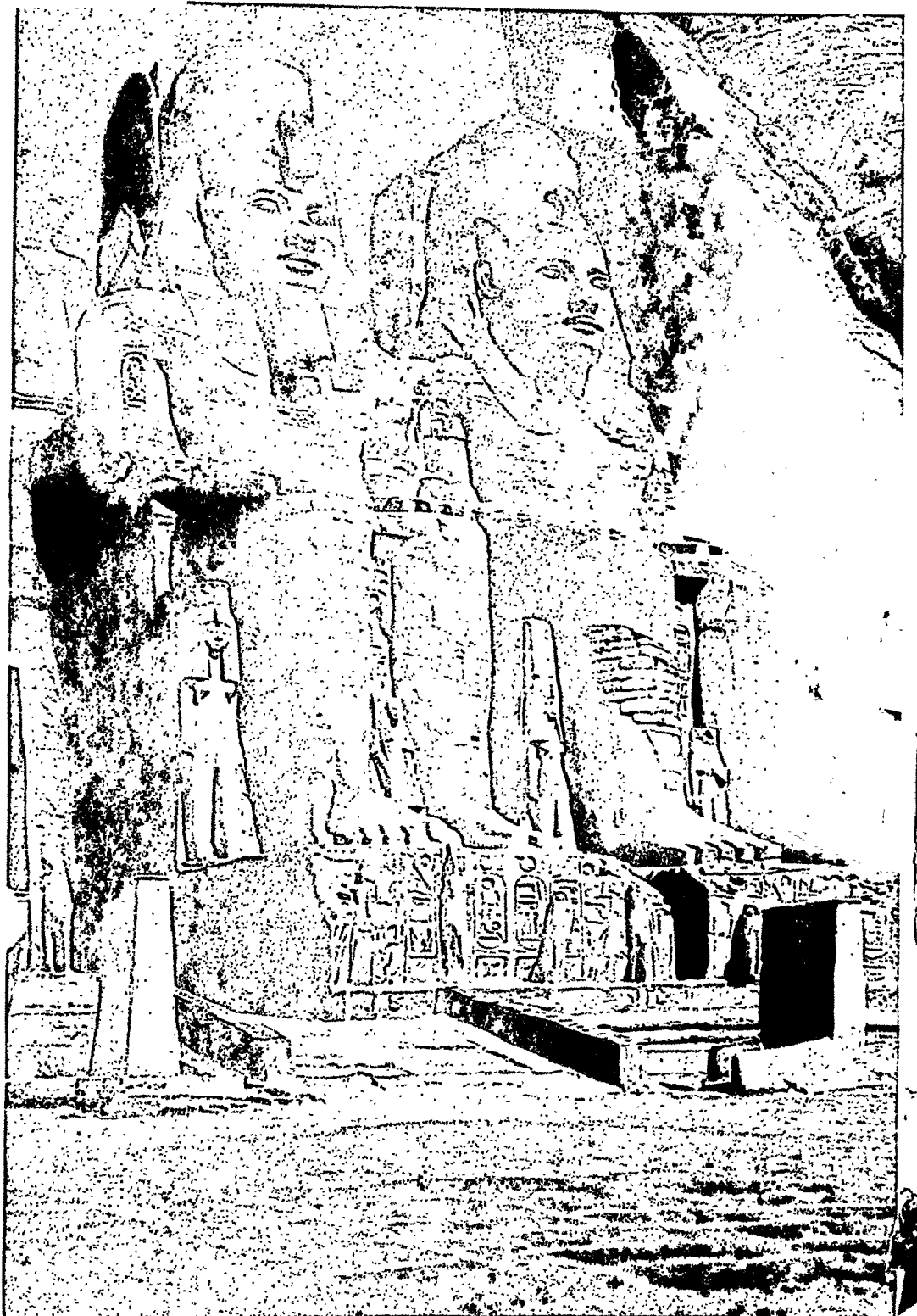
At Tell el-Amarna some of the principal houses, though contemptible enough by the side of the vast royal palaces, consisted



HOW THE EGYPTIANS MEASURED TIME

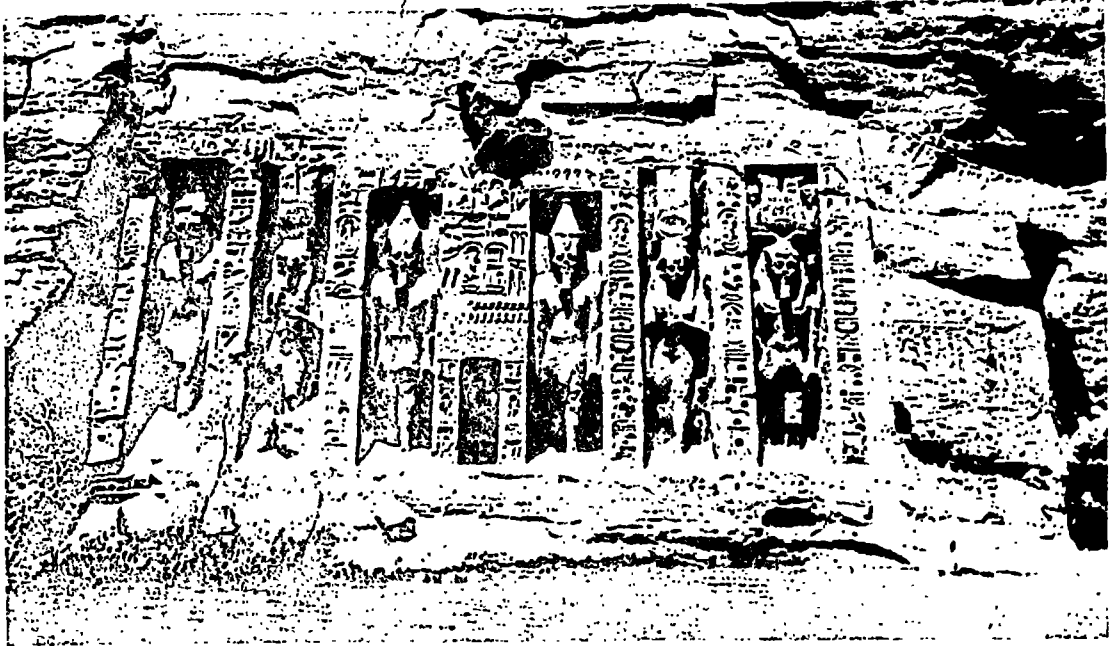
A specific invention to be credited to Eighteenth Dynasty times is the water-clock (see page 704). It seems to have been invented by one Amenemhet; this is an example in alabaster from later in the same dynasty.

Science Museum, South Kensington



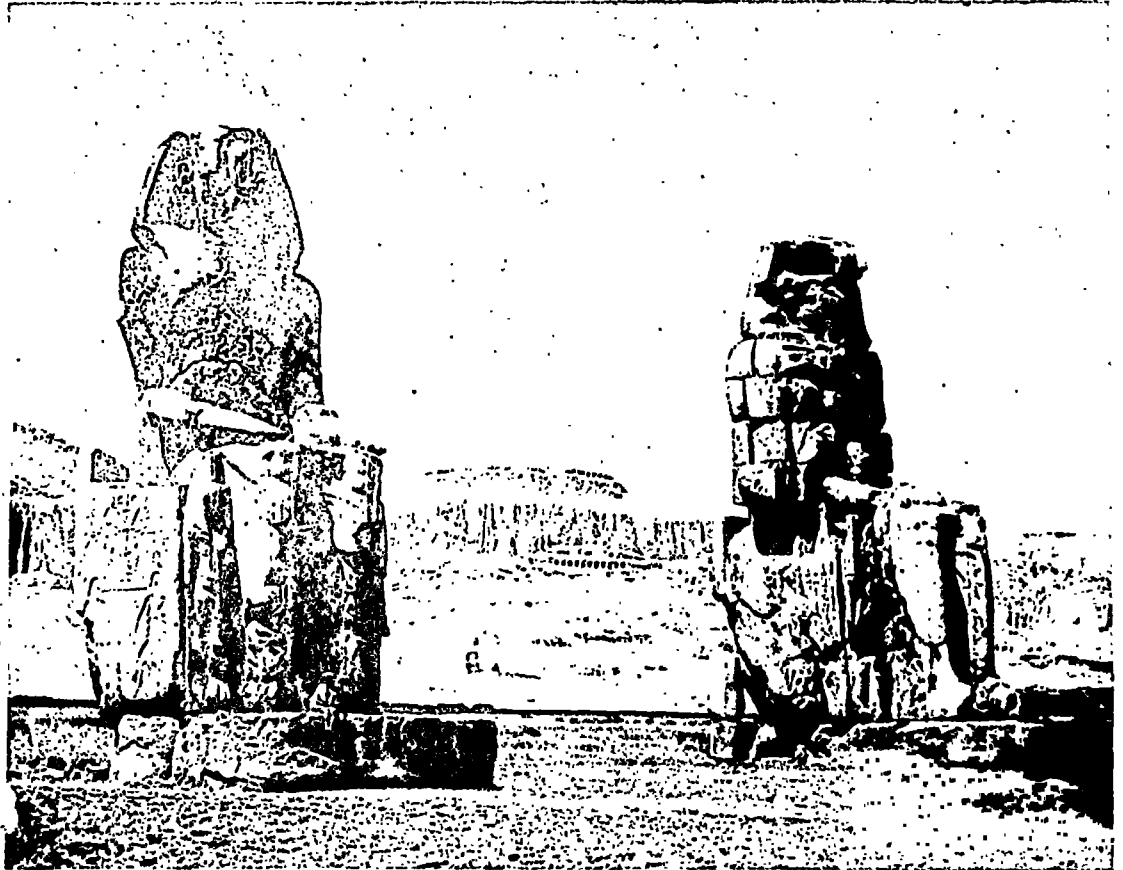
ROCK-HEWN COLOSSI OF ABU SIMBEL SEEN UNDER THE NUBIAN MOON

One of the most impressive Egyptian temples is in Nubia, proof of Egypt's cultural and political domination over that country. Every detail is hewn out of the sandstone cliffs that bound the Nile at Abu Simbel, including the four 65-ft. colossi of Rameses II, its builder, that flank the entrance.



WHERE A QUEEN WAS WORSHIPPED AS THE EQUAL OF A GODDESS

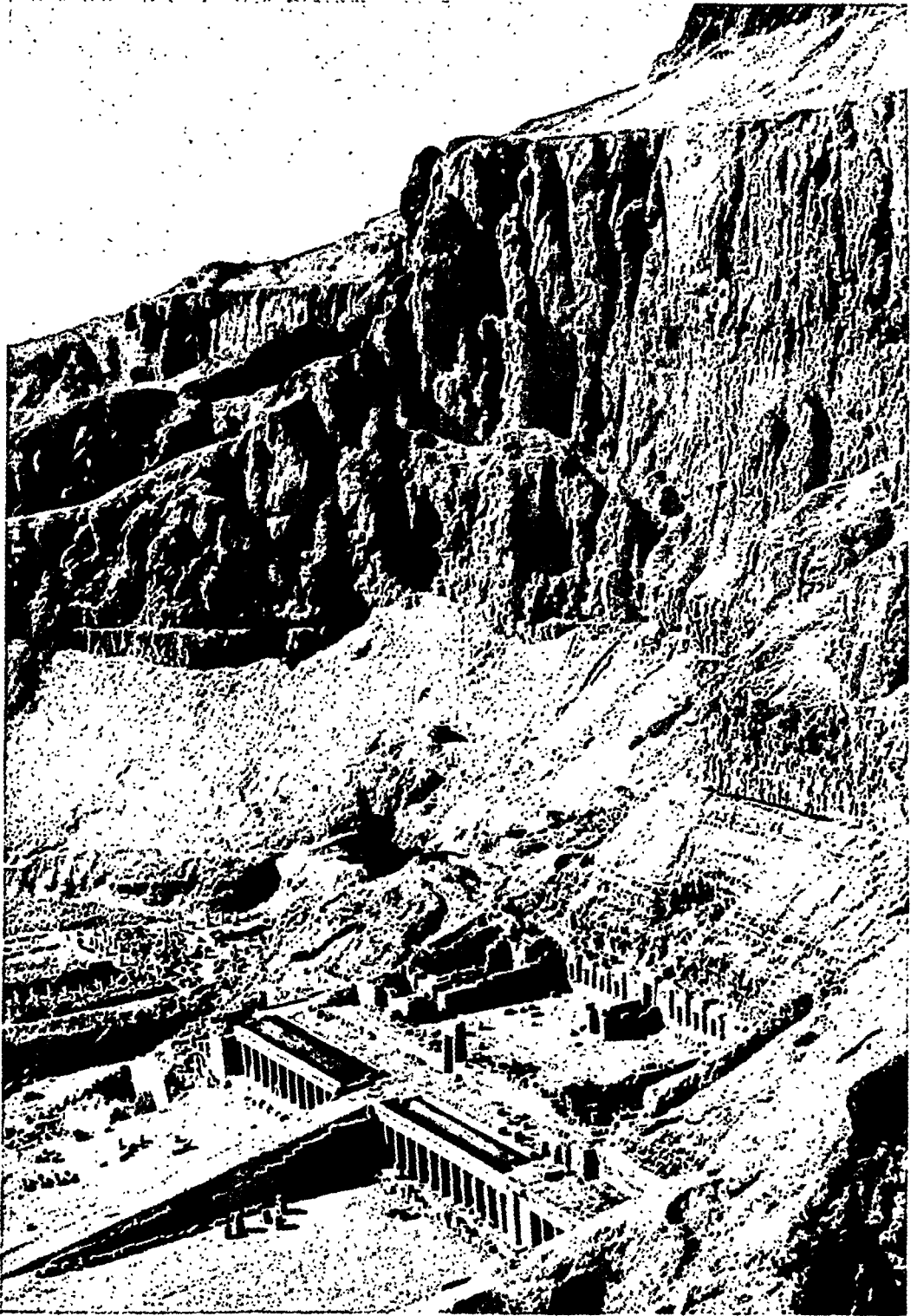
Rameses II dedicated the great temple in the preceding page to Amen-Ra, Ra-Harakhte, Ptah and himself; a smaller, near by, of which the façade is shown above, was hewn for his wife Nefertari and the goddess Hathor. Of the colossi, four represent himself and two Nefertari.



MEMORIALS TO THE GREATNESS OF AMENHOTEP THE MAGNIFICENT

Mistaken by Roman sightseers for statues of Memnon, these two colossi of Amenhotep III stood before his mortuary temple on the west bank of the Nile opposite Thebes; the temple itself has long since vanished. It was the right-hand colossus that used to emit a metallic noise at sunrise.

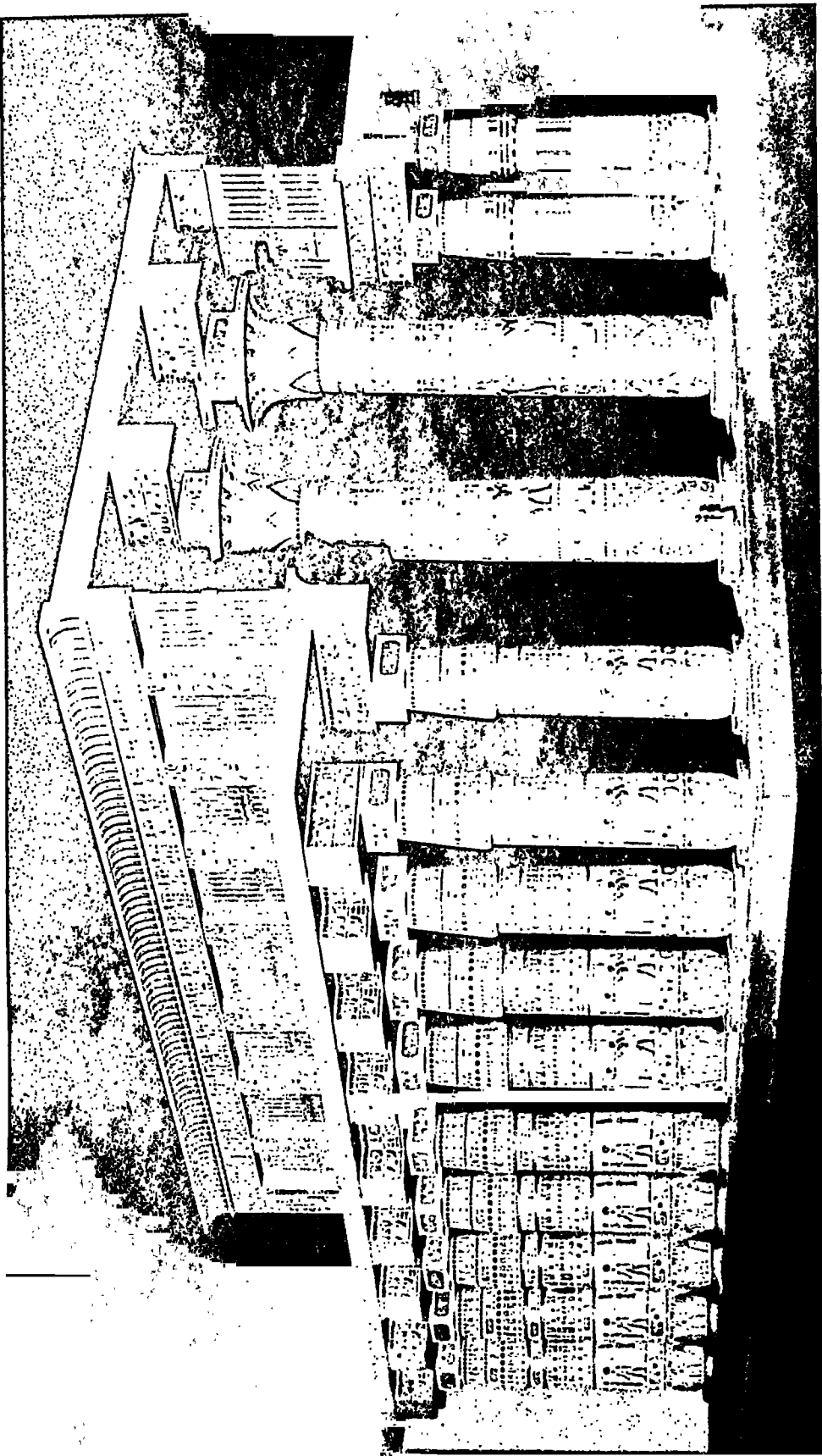
Photo, Mansell



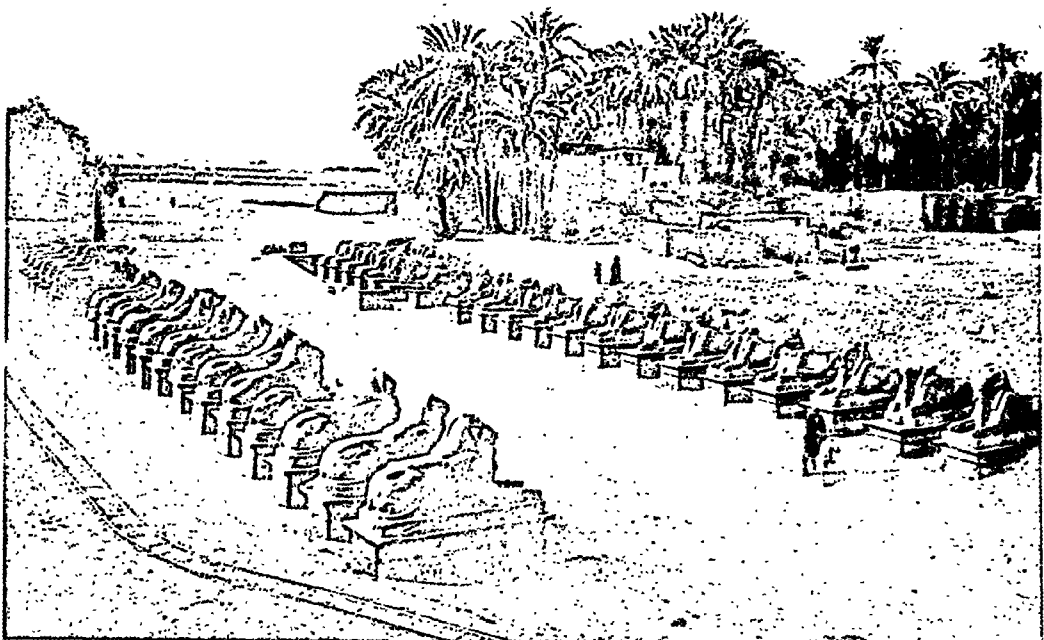
TEMPLE BUILT BY EGYPT'S MASTERFUL QUEEN HATSHEPSUT

Partly built and partly cut into the rock, the mortuary temple of Queen Hatshepsut at Deir el-Bahri rises in three terraces, of which the central and upper are seen in this photograph. Among the most interesting of its reliefs are those that record her great expedition by land and sea to Punt.

Photo, L'hneri & Landrock

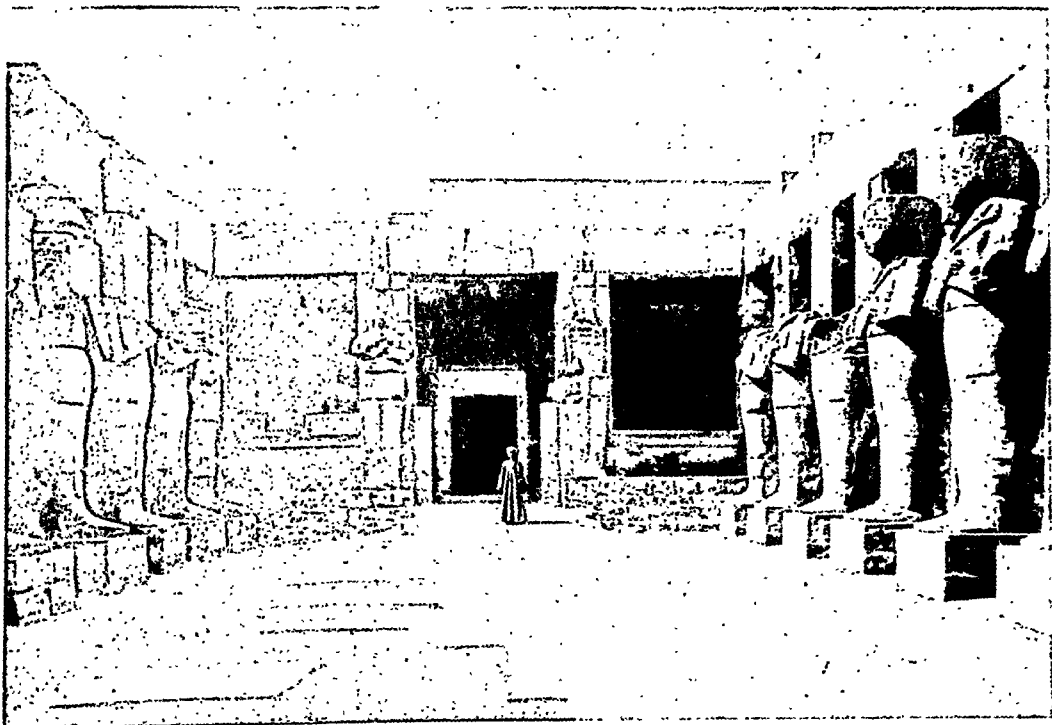


TO THE GLORY OF AMEN: PART OF THE VAST PILLARED HALL IN THE MOST WONDERFUL BUILDING OF ANCIENT EGYPT
Egypt's mightiest building, the Temple of Amen at Karnak (Thebes), was not the work of a single period, but received continual additions from the Twelfth Dynasty (c. 2000 B.C.) to the time of the Ptolemies (c. 200 B.C.). This restoration is of the central part of the gigantic Hypostyle Hall erected by Seti I and Rameses II. The vast columns with calyx-capitals are nearly 70 feet high and 33 feet round; the lower columns with bud-capitals, some 43 feet high.
Metropolitan Museum, New York



PROCESSIONAL WAY BETWEEN TWO OF THE MIGHTY TEMPLES AT THEBES

A stately feature of Thebes in its prime must have been the long avenue of ram-headed lions, or criosphinxes, that led from the temple at Luxor to the Great Temple of Amen at Karnak—modern villages a mile and a half apart, but both within the circuit once covered by the ancient city.



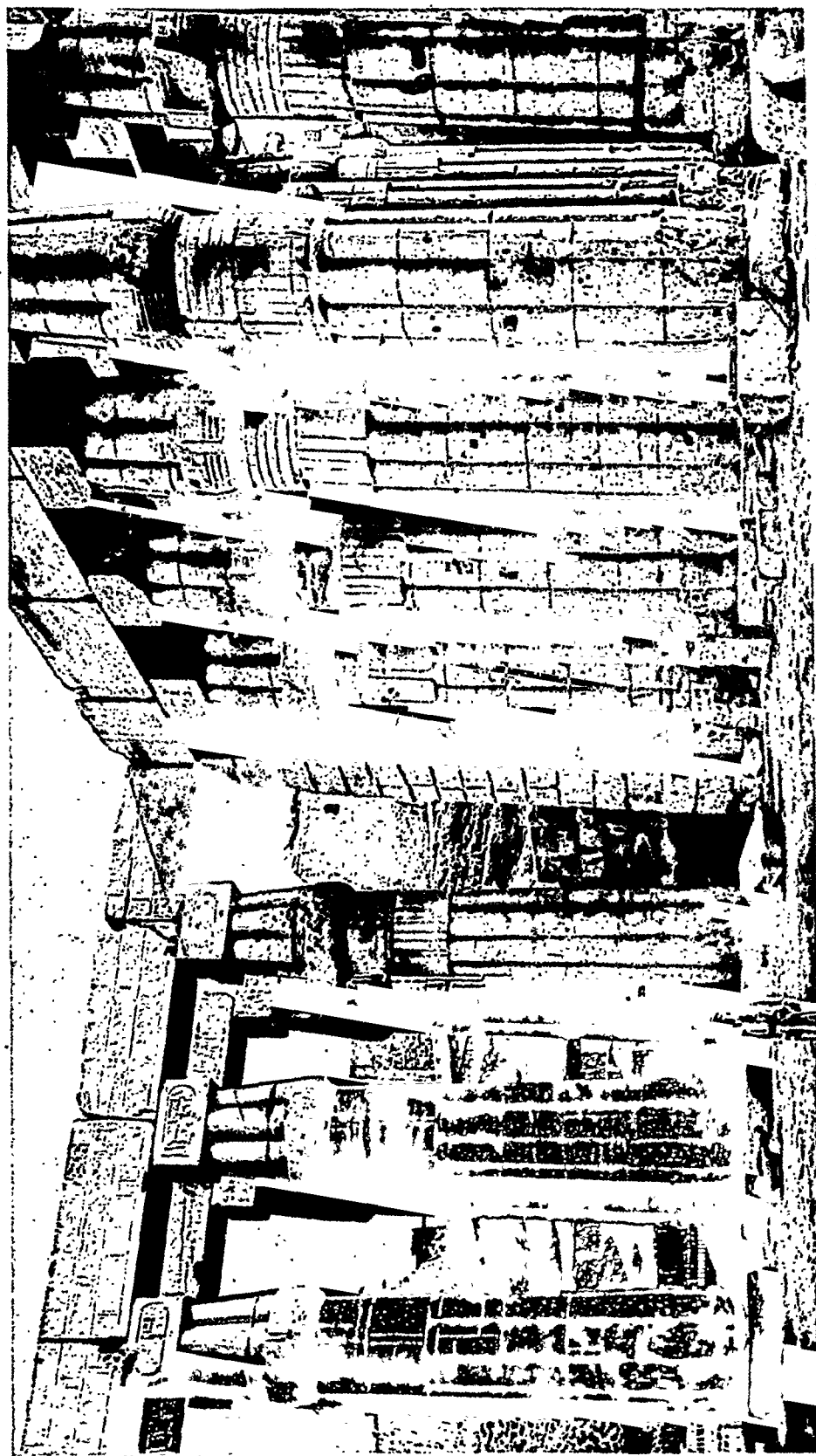
ERECTED BY THE WARRIOR PHARAOH WHO DEFEATED THE PHILISTINES

When the later Bubastite pharaohs of the Twenty-second Dynasty built the huge open-air court in front of the Karnak temple, this small but very well preserved temple of Rameses III, hitherto distinct, was incorporated in the south wall. Osiris figures of the king surround its colonnaded court.



STATUES OF THE GREATEST BUILDER WHO SAT ON THE THRONE OF EGYPT IN THE TEMPLE OF AMENHOTEP III AT LUXOR

The temple at Luxor was begun by Amenhotep III and dedicated to the Theban triad : Amen, his wife Mut and their son Khons the moon god. Other royal builders, however, took their turn, and these two colossal statues of Rameses II are to be seen in the great court that he added ; that on the left is exceptionally fine, having lost no more than the crown. One of the pharaohs concerned in the building of this temple was Tutankhamen.



CLUSTERED COLUMNS SURROUNDING A MAJESTIC TEMPLE COURT BUILT BY EGYPT'S 'ROI SOLEIL'

This part of the Luxor temple is the work of its actual founder, Amenhotep III. It is a great open-air space, measuring 49 by 56 yards, with a double row of columns forming a colonnade on three of its sides and the pillars of the temple portico proper (right) on the fourth. The columns, still bearing much of their architraves, are extremely graceful in their proportions; they represent clusters of papyrus reeds, with papyrus buds as their capitals.

P'Kolu, Sir Flinders Petrie



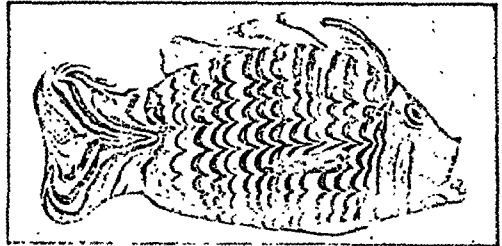
WHERE RAMESES III RECORDED BOASTFULLY THE STORY OF HIS CAMPAIGNS AGAINST THE HITTITES

In the so-called Ramesseum we again meet with the work of that indefatigable builder, Rameses II. The edifice, standing not far from the Colossi of Memnon, was the mortuary temple intended for services in honour of the deified king after his death. This view shows the Hypostyle Hall from the east, or all that remains of it, together with four of the figures of Rameses, represented in the guise of the god Osiris, that surrounded the open court in front of it.

Photo, Herbert Fellon

of from fifteen to thirty rooms each. They were solidly built, and were surrounded by large enclosures and out-buildings. Most of them were raised above the ground level on an artificial footing, and the entrance door was consequently reached by a few broad and shallow steps. The approach ran along one side of the house beneath a large low-placed loggia window open to the north-west breezes, from which business could be transacted with employees and others without their entering the house. The main entrance was sometimes of stone sculptured with the name and titles of the owner. As in eastern houses to-day, the ordinary windows, intended only for lighting, were small and set high up, just under the roof.

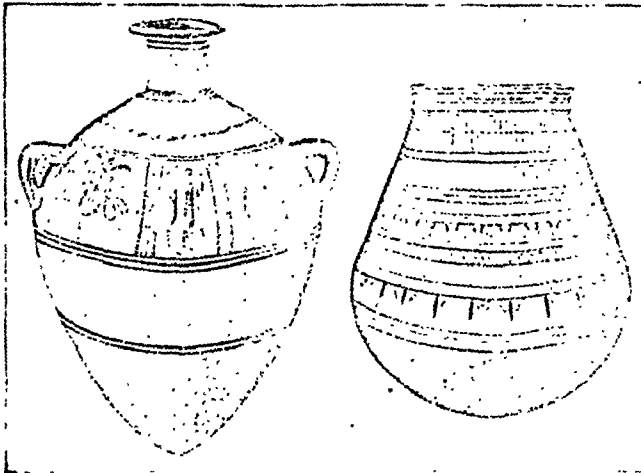
The principal room for the reception of guests was in the centre of the house. Its walls were carried up higher than the rest in order to obtain space for outer windows; inside, the walls were varied by one or two niches, reaching to the ground, and painted red and orange; the roof was supported by wooden columns on stone bases and at one side was a raised dais for the master and mistress. A porter's lodge at the door, bed chambers, harem quarters and lavatories can also be distinguished and rooms and annexes for cooking, and there was a staircase to



DELICACY OF EGYPTIAN GLASSWORK

Glass, opaque and cast over a mould by dipping, was put to delicate use, as shown by these bottles—one fish-shaped. The variegation was produced by threads and bars of different colours laid on and softened by heating.

Courtesy of Egypt Exploration Society



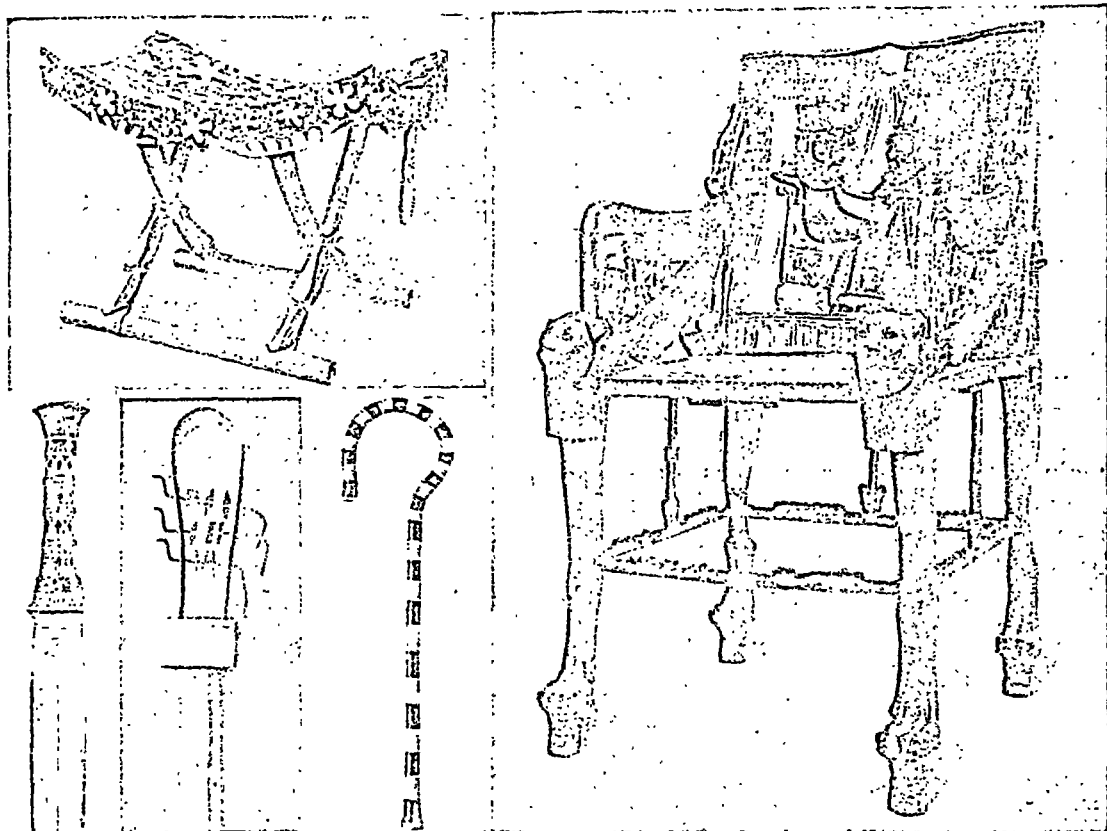
A FASHION FOR PAINTED POTTERY

The decoration of his pottery was not a labour on which the Egyptian in historic times usually expended his best efforts; but the latter half of the Eighteenth Dynasty experienced a vogue for gaily painted ware. These pots from Akhetaton are of buff material ornamented with black, brown and blue.

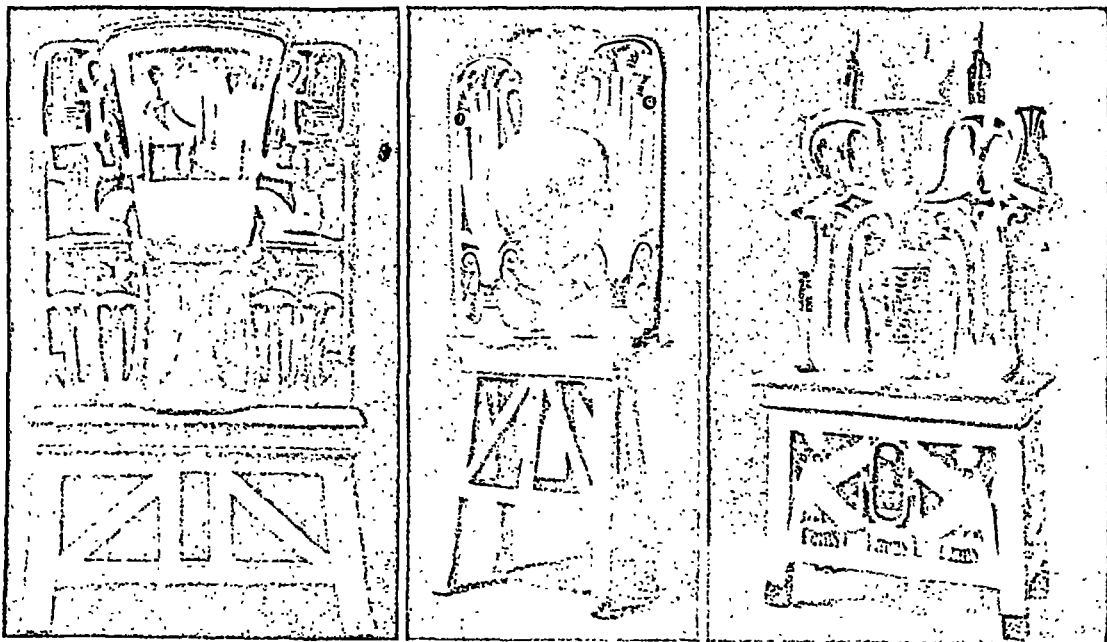
From 'The City of Akhenaten,' Egypt Exploration Society

the roof, - but apparently no upper floor. The materials for the platform on which the house stood and for the crude bricks of which the house was built were dug on the spot out of the desert soil, and in the deep excavation which resulted a well for water was easily made. Good soil was then brought from the cultivated land for trees to be planted inside the house enclosures on the full desert.

Great establishments of sculptors and smaller workshops of glassmakers and leatherworkers have been recognized amongst the houses, and doubtless every trade of luxury was well represented in Akhetaton. Amongst both



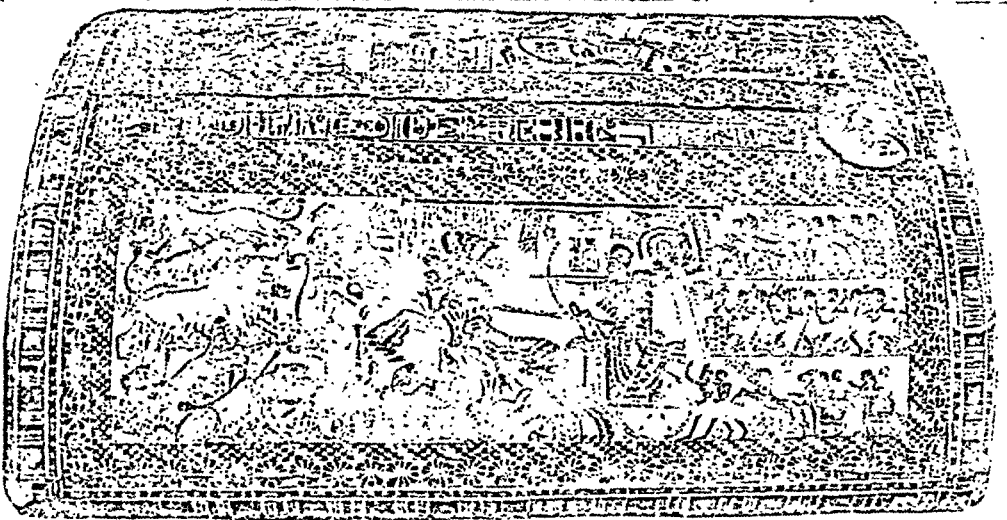
A folding chair of ebony, its legs inlaid with ivory to resemble ducks' heads; a gold dagger; sistrum (the musical rattles used especially in the worship of Hathor); and a crook-shaped sceptre of blue glass and gold were among the smaller objects found. Outshining them all was the gorgeous throne, on whose back of sheet gold Tutankhamen, in carnelian, red glass, silver and faience, is being anointed by his wife—a relic of the days of Akhetaton.



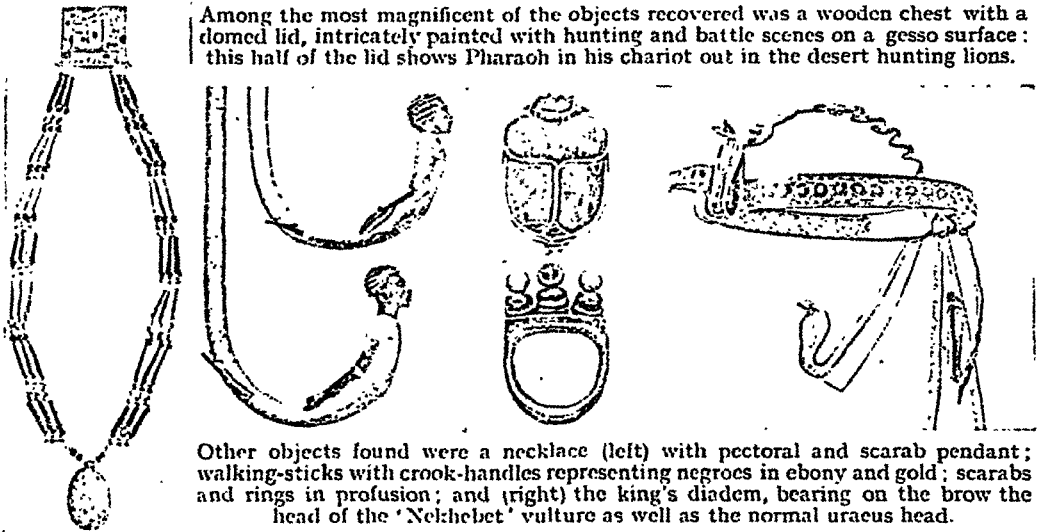
The revelation of the kingly treasures of Tutankhamen's tomb in the years following 1922 shed a rich light on the sumptuousness of Egyptian court furniture. Below are some of the striking white alabaster vessels, on the right perfume vases and on the left a lamp. Only when a wick floating on oil within it is lit can the king's seated figure be seen; apparently he is painted on the outer side of a thin inner cup turned accurately to fit and cemented in place.

TREASURES FROM THE TOMB OF THE BOY KING TUTANKHAMEN

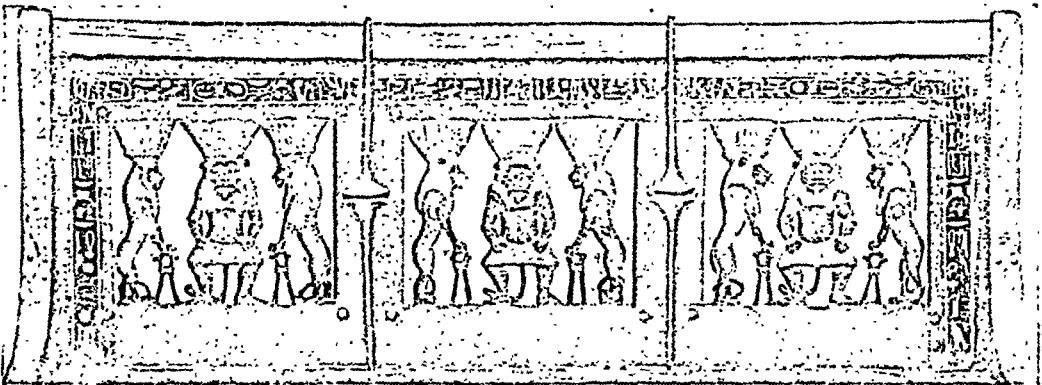
From Howard Carter, 'The Tomb of Tutankhamen' Vols. 1 and 11



Among the most magnificent of the objects recovered was a wooden chest with a domed lid, intricately painted with hunting and battle scenes on a gesso surface: this half of the lid shows Pharaoh in his chariot out in the desert hunting lions.



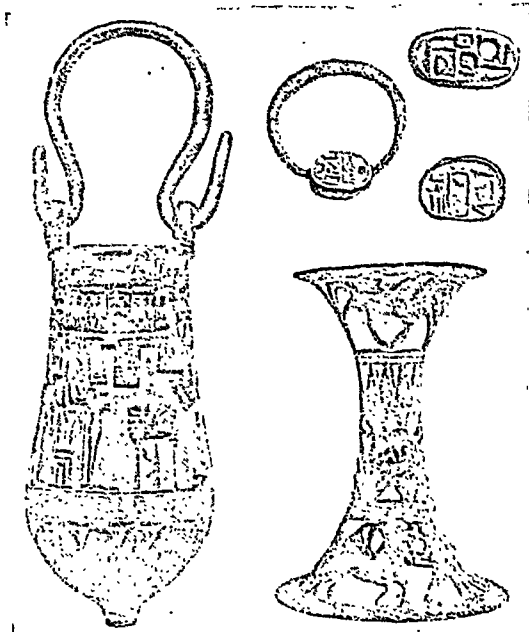
Other objects found were a necklace (left) with pectoral and scarab pendant; walking-sticks with crook-handles representing negroes in ebony and gold; scarabs and rings in profusion; and (right) the king's diadem, bearing on the brow the head of the 'Nekhebet' vulture as well as the normal uraeus head.



In spite of the great stir in the world that their discovery caused, the items of Tutankhamen's funerary equipment added comparatively little to archaeological knowledge; most of them can be paralleled, on a less sumptuous scale, from other sources. The great bed, for instance, of which the head-piece is given above, is very like that of Iuaa in page 701; even the decoration is the same, consisting of the genial household god Bes between facing figures of Taurt, protectress of childbirth.

OBJECTS OF ART THAT DECORATED TUTANKHAMEN'S PALACE

From Howard Carter, 'The Tomb of Tutankhamen' (Vols. I and II)



WHAT THE METAL WORKERS ACHIEVED

The bronze situla on the left and the bronze vase-stand are outstanding examples of Egyptian metal work—'situla' is the technical name applied to a vessel for making offerings. Above, a ring and scarabs from Tell el-Amarna.

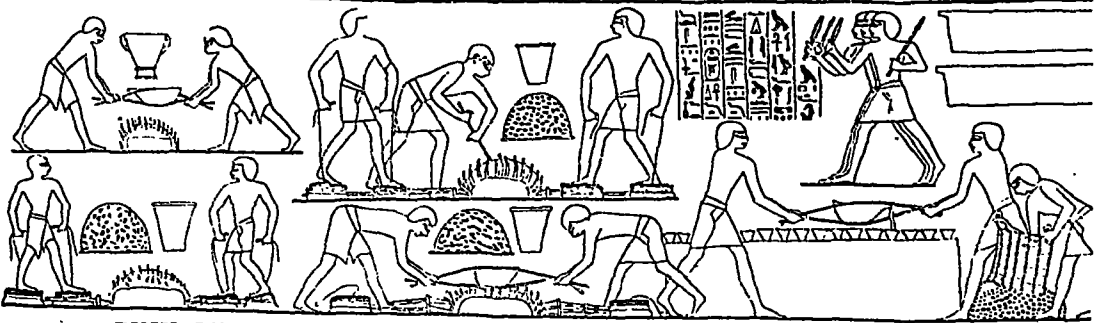
Photos, Mavsell and Egypt Exploration Society

small and great there seems to have been a rage for making pretty but fragile finger-rings, beads, pendants and other ornaments for stringing and for decorating garments, in glazed ware of many colours, the moulds for this purpose being found in every house and hut. A factory for the moulds was in the market place.

Not much can be said of the furnishing of the buildings at Tell el-Amarna, for virtually all has perished. From the

tomb of Tutankhamen we learn much as to the furniture and equipment of a palace, the magnificent tables, boxes, beds, chairs, folding seats and footstools, the gorgeous chariots, whips, walking-sticks, bows, daggers, etc., with much display of gold and ivory and ebony. At Tell el-Amarna are found such articles of little value as could resist occasional dampness and white ants.

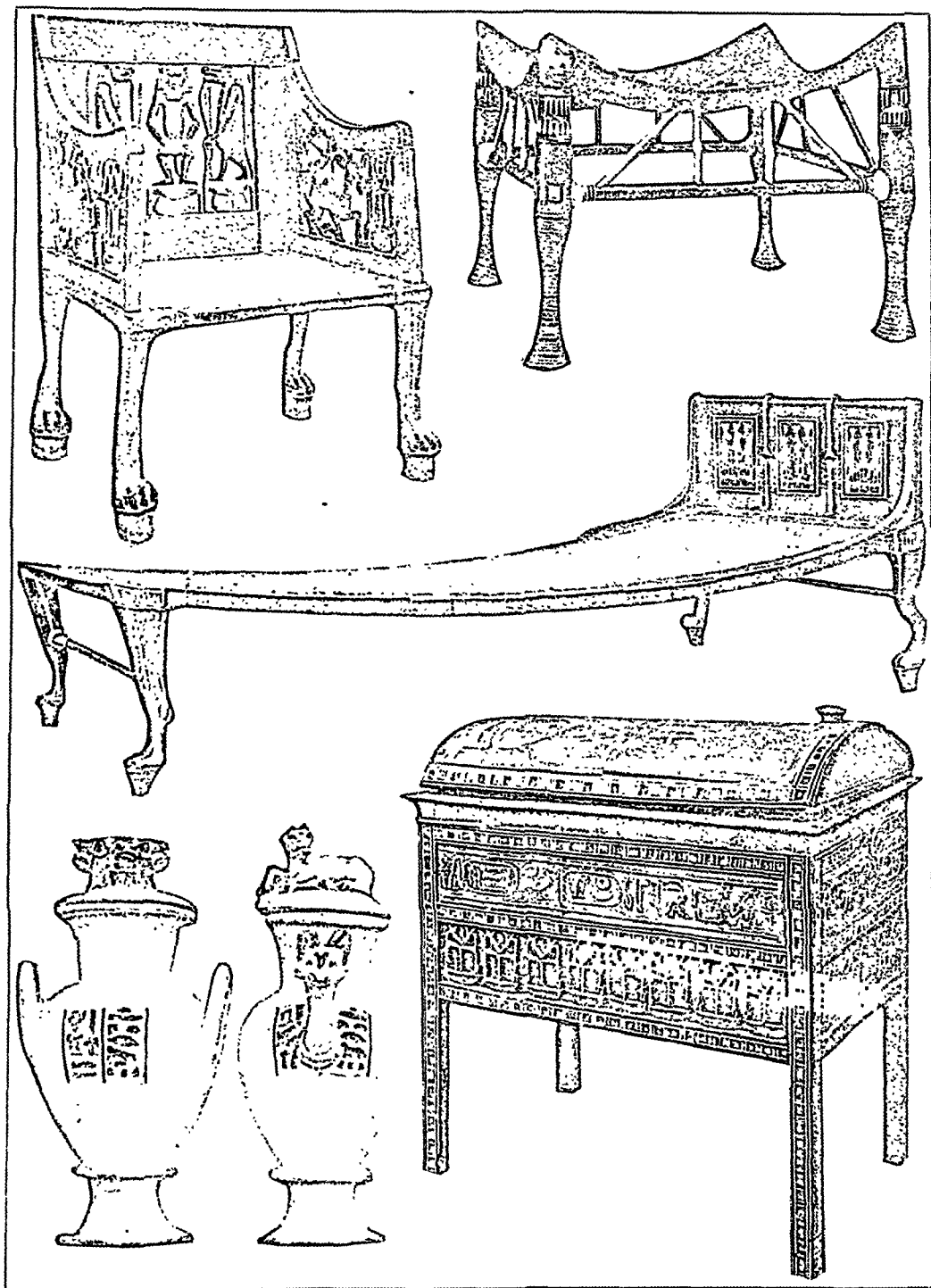
Among these are stands for ablutions and low tripod stools of stone, the latter surprisingly comfortable to sit on, and, above all, quantities of pottery, wine jars labelled with the vintage, the estate and the name of the chief husbandman; jars of preserved meats (sometimes a regular game-pie) or of oil, all with details written outside. Instead of our cupboards or niches in the walls, large jars were often sunk in the floors of the rooms as receptacles for storing food, etc. Frequently articles of some value, such as hacking knife-blades and axe-blades, were hidden temporarily in the sand against the inside walls; then sometimes they were forgotten—to the profit of the archaeologist. In one case, three precious glass vases so hidden were covered over by a second flooring during 'alterations,' and were revealed only by the clearance of the Egypt Exploration Society. Many houses possessed a special safe for valuables in the shape of a neatly made pit beneath the floor, closed by a stone slab and concealed from observation by the sand or the crude tiles of the flooring. To warm the chief reception room on cold winter nights, a



BUSY SCENE OF METAL WORKERS AT THEIR SWELTERING TASK

An invention that must have lightened the task of the metal worker appears at about this period—leather bellows worked with alternate feet and re-inflated by pulling on a string. We see them in this painting from the tomb of Rekhmara, prefect of Upper Egypt in the reign of Thothmes III, where workers are bringing charcoal in a sack, stoking the furnace, lifting off the crucible of molten metal and pouring it into moulds. Brazen doors for the temple of Amen are being made.

From Newberry, Life of Rekhmara



CONTENTS OF A TOMB THAT WAS FURNISHED LIKE AN EARTHLY HOME

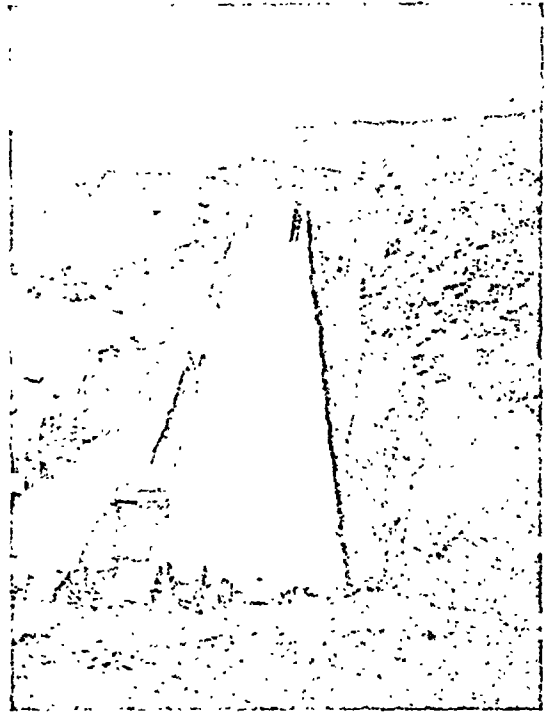
A discovery scarcely less informative on the subject of Egyptian furniture than the tomb of Tutankhamen was that of Iuaa and Tuaa, parents of the queen of Amenhotep III; opened in 1905, it revealed a wealth of objects such as these. The coffer is inlaid with gold, blue faience, ebony and stained ivory; the chair has its openwork back carved in the form of the god Bes and the hippopotamus goddess Taurt, while the wood panelling of the bed is inlaid with the same theme.

From Theodore Davis, 'Tomb of Iouiya,' and British Museum

fire-pan was sunk in the middle of the floor, near the dais, and the charcoal in it kept aglow; such fire-pans could be carried about from room to room.

At this period the red pottery jars of all shapes and sizes were painted with bands and with floral and other designs in pale blue, giving a very gorgeous effect. This practice, begun under Amenhotep III, did not outlive the Eighteenth Dynasty.

The Ancient Egyptians were extraordinarily skilled in many crafts. We may well marvel at their power of transporting colossal monuments, weighing up to a thousand tons, from the quarry to the distant temple, of raising obelisks to the vertical position on a narrow basis, all without engineering tackle, and of decorating the walls of profound and dark



GIANT OBELISK UNFINISHED

What would have been the tallest obelisk known to us (137 feet) lies unfinished in the granite quarries at Aswan, abandoned because of a flaw in the stone. Its estimated weight is 1,170 tons.

Photo, A. M. MacGillivray

cavern-tombs with fine and gaily coloured paintings. These wonders, indeed, have found their explanation in the last few years; and perhaps before long it may be determined how enormous surfaces of granite and other hard stones were covered with delicate sculpture and hieroglyphic inscriptions in the course of a single reign.

Such marvellous feats have led people to claim for the Ancient Egyptians all sorts of scientific knowledge that belongs only to much more recent times. Their limitations are in fact almost as surprising as their accomplishments. According to Elliot Smith and Ruffer, the examination of endless mummies and skeletons has revealed no trace of surgical operations beyond the application of splints to broken limbs. Stopping of teeth, in spite of a popular belief to the contrary, was unknown, and even of extraction there is no tangible evidence. Egyptian teeth were generally healthy, though often worn down by gritty food, but amongst the rich and luxurious there arose dental trouble, and we can discern from the mummy of Amenhotep III that he, the



TO RECORD ROYAL TRIUMPHS

Obelisks were monuments, mainly triumphal in intention, standing usually in pairs before the gates of a temple. These are the survivors of two distinct pairs set up in the Great Temple at Karnak (Thebes)—that on the left by Thothmes I (reinscribed by Rameses II), that on the right by Hatshepsut.

Photo, Gaddis & Seif

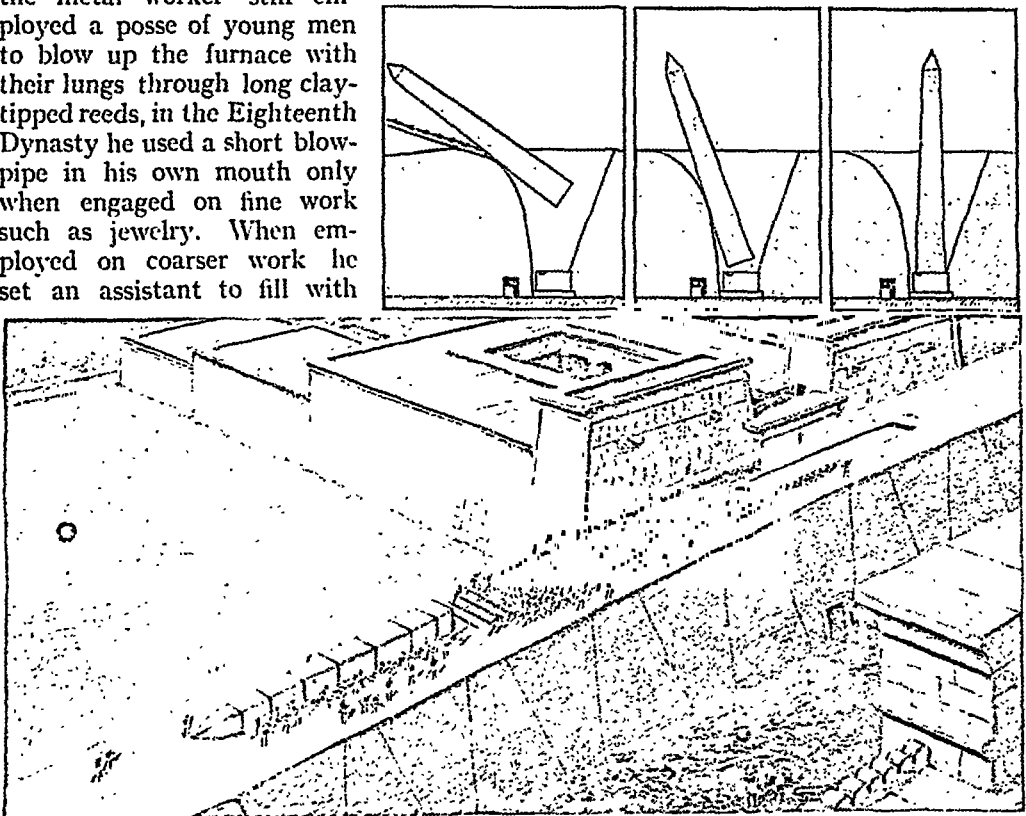
most magnificent of Pharaohs, suffered severely from toothache in his later years, and apparently no relief was attempted. Yet we recognize the progress of invention and technical improvements in various directions, some of them doubtless suggested by the work of craftsmen of other nations.

Under the Empire mummification began to come within the reach of quite humble people. The costly preservation of the bodies of royalties attained the highest level under Seti I, while the task of making a life-like mummy out of the dead body without regard to the preservation of the tissues, the aim of the Egyptian embalmers, was most successfully accomplished in the degenerate times of the Twenty-first Dynasty.

Arts more generally useful also progressed. Whereas in the Middle Kingdom the metal worker still employed a posse of young men to blow up the furnace with their lungs through long clay-tipped reeds, in the Eighteenth Dynasty he used a short blow-pipe in his own mouth only when engaged on fine work such as jewelry. When employed on coarser work he set an assistant to fill with

air and empty a pair of bladders or leather bags into a bellows-pipe, treading them down alternately with each foot and raising them again by a string in each hand. Glass, too, was a recent invention, and was used like a new metal for making ornamental vessels in varied colours by dipping over a mould. The earliest datable specimen bears the name of Thothmes III.

Glass was largely used for ornamental inlays, and sometimes for statuettes. At the palaces of Amenhotep III and Akhnaton glass was very fashionable, and its manufacture has been fully illustrated by Sir Flinders Petrie from the workshops at Tell el-Amarna. The glass vessels were opaque with a brilliant exterior surface, while the interior of the vessel was rough from contact with the gritty mould; in the case of open cups and platters this could be elaborately ground and polished



MARVELLOUS ENGINEERING PROBLEM SOLVED BY THE EGYPTIANS

How the ponderous yet slender shaft of an obelisk was erected is one of the many problems that Egypt has set to be solved. Probably it was dragged base forwards up a prepared ramp until it overhung a sand-filled pit. On the sand being slowly withdrawn through a hole beneath, the base sank gently down the curved side of the pit until it engaged in a notch cut in the pedestal; the obelisk was then almost upright, and haulage would easily complete the operation.

After R. Engelbach

away, but in bottles the roughness had to remain. Blown glass, in spite of frequent statements to the contrary, did not appear till about the time of the Roman Empire.

Bronze, easily melted and moulded, was now the regular material for tools and weapons, as opposed to the copper of the earlier ages. Iron was already employed, although its working was not familiar to the Egyptians, and tools and weapons made of iron were very rare and costly. Flint was scarcely used except for the armature of wooden sickles.

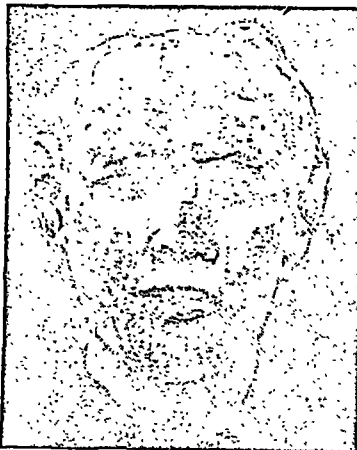
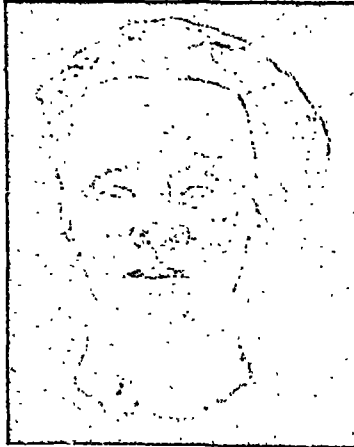
Trade was carried on by barter; there was still no currency; but exchange by weight of metal, in rings or otherwise, for corn, slaves, animals, etc., was recognized, and goods of all kinds could be valued on a metal standard for convenience, as had been done even in the Old Kingdom. The balances for weighing showed an improvement; the scale-pans, which used to swing high in air on short cords, now almost touched the table like modern balances, saving much time in weighing.

For measuring time, an ingenious man named Amenemhet, living at Thebes in the reign of Amenhotep I, invented or

improved a water-clock in the form of a bowl marked inside with graduated scales of hours for the separate months, the water dripping slowly from a hole on one side of the base. Of this type a fine specimen in alabaster survives from the reign of Amenhotep III, and the principle remained unchanged for temple clocks in the time of Alexander the Great and onwards.

Early in the Eighteenth Dynasty temple building began to be on a vaster scale than at any other period; walls that earlier builders might have left in crude brick were replaced by fine limestone from Tura, alabaster and even granite. The immensity of the works undertaken, however, led the kings of the dynasty to employ Libyan sandstone throughout in Upper Egypt and Nubia, where this rock abounded. It was of uniform texture, easily worked but of too coarse a grain for fine sculpture; granite, quartzite and the choicer stones were then reserved for doorways and for special monuments such as shrines, obelisks and statues.

Amenhotep III added enormously to the Theban temples; on the east bank southward from the



CASTS TAKEN 3,000 YEARS AGO FROM THE FACES OF LIVING EGYPTIANS

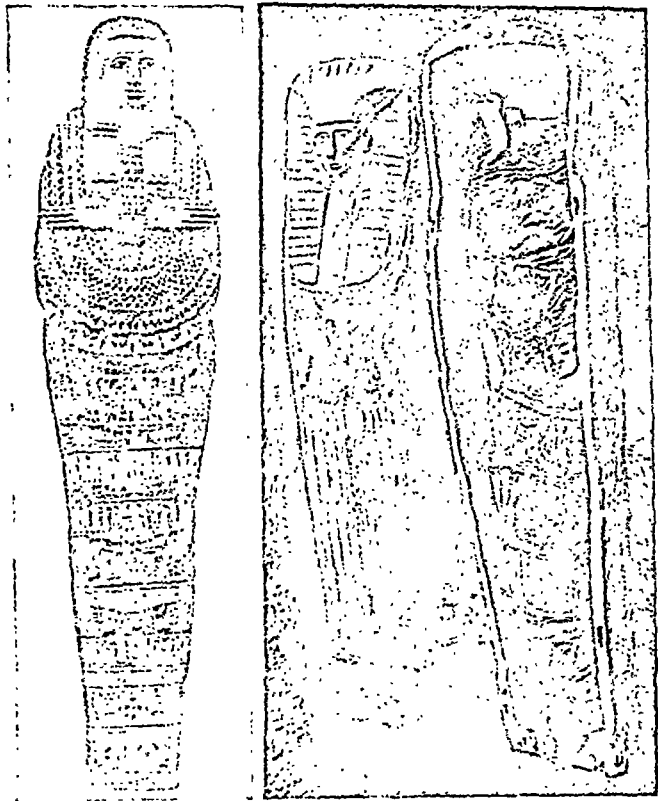
That same Thothmes who produced the lovely head of Nefertiti in the colour plate facing page 752 seems to have filled his studio with casts, taken from both the living and the dead, to act as guides for portrait statuary; the four given here are life-masks. They are mostly of Egyptian nobles; but strangely enough there are some unquestionably not Egyptian; that above would easily pass as a Nordic type, while the lady, shown full-face and profile, is definitely European.

Berlin Museum

temple of Amen at Karnak he founded a special temple for the goddess Mut, the consort of Amen, and at the same time built a new temple to Amen at Luxor. These three temples he connected by avenues lined with ram-headed sphinxes, along which processions could carry the divinities for festal visits. The temple of the god Khensu (Chons), the third member of the Thēban triad, dated originally from the same reign, though it was entirely rebuilt in the Twentieth Dynasty; and farther north was a large temple of Mont, the war god of Hermonthis, of which little now survives. On the west bank the monolithic colossi of 'Memnon' in hard quartzite, which look eastward across the plain and the river, are the last remains of a vast funerary temple of the same king. It is strange that so magnificent a builder should not have scrupled to break up the beautiful alabaster works dedicated to Amen by his ancestor Amenhotep I, and cast them contemptuously into the foundations of a new pylon.

Rameses II outrivalled Amenhotep III both in extent of temple building throughout Egypt and in scandalous destruction or (in his case) usurpation of earlier work. It was he and his immediate predecessors of the Nineteenth Dynasty who invented the great Hypostyle Hall of Karnak, with its thick forest of rather ungainly columns, and his granite colossi at Tanis and in the Ramesseum at Thebes exceed all others in size.

But if kings endeavoured to surpass each other in magnificence, the Egyptian artists rivalled each other in delicacy of workmanship. The small sculptures of figures in wood and stone of the end of the Eighteenth Dynasty are exquisite specimens of art in design and execution. The attitudes and actions are no longer fixed by tradition but are taken fresh from



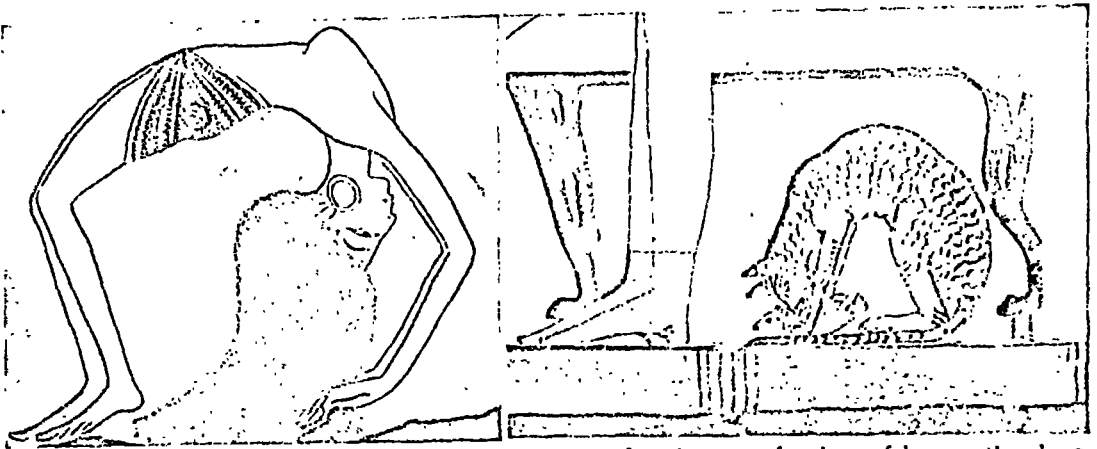
HOW THE EGYPTIANS TREATED THEIR DEAD

The art of mummification, hitherto a process of doubtful success, reached its high-water mark during the Empire. Left, the human-shaped coffin (of a priestess) in which the mummy was placed; right, a coffin with the lid removed to show the mummy within. The whole, except among the poor, was usually placed in a stone or wood sarcophagus.

Left, British Museum; right, British School of Archaeology in Egypt

life; we have studies of a young girl gathering lotuses in a marsh or a slave carrying a heavy vase on his bent back. The highest level of spiritualised portraiture is attained in the head and neck of Nefertiti, queen of Akhnaton, a work in the round which was kept as a model in the workshop of the sculptor Thothmes at Tell el-Amarna and is now in the Berlin Museum (see plate facing page 752). It shows what the world must have lost by the destruction of the monuments of Atonism. Greek art belongs to a different order of ideas, and there is nothing until we reach the beginning of the Renaissance in France even to compare with this Nefertiti.

Wall decoration was in great demand in the Eighteenth Dynasty, not only in the tombs but also in palaces and private houses. It made no progress whatever



Painted on a sherd, the girl acrobat (left) shows in the flat the same freedom of line as the slave below in the round; the date is Nineteenth Dynasty. The homely and altogether delightful study of a cat eating fish beneath its mistress's chair, occurring in the tomb of the astronomer Nakht (c. 1400), is one of the series of copies made by Mrs. N. de G. Davies from Egyptian tomb paintings. Turin Museum and courtesy of Dr. A. H. Gardiner



Egyptian art never completely lost its conventionality, but during the Eighteenth Dynasty much of the formal rigidity of attitude was purged away. Some of the little statuettes especially show this; on the left is an exquisite study of a slave bearing a heavy pitcher on his back. On the right is a Theban tomb painting of Queen Aahmes-nefertari (mother of Amenhotep I); she is represented in the guise of the necropolis goddess, of whom the flail and black-painted face are attributes.

HOW SOME OF THE SHACKLES OF CONVENTION WERE SHED UNDER THE EMPIRE

Courtesy of Director of Free Public Museums, Liverpool, and British Museum



When the guests had assembled, the unmarried folk evidently kept to themselves, for elsewhere in this fresco we see separate groups of maidens and bachelors; these are the married couples. Slaves wait on them, while the ladies carry lotus flowers which they smell from time to time.



All sorts of entertainment were provided for the company, and we know that any novelty, such as a dwarf from Nubia, was eagerly sought for; but music and dancing were the stock resources. Notice the elaborate garments of these musicians, characteristic of the luxury under the Empire.



The festive side of social life among the noble Theban families is amply illustrated in the tombs; evidently the Egyptian looked forward to an endless round of entertainment in the next life. Above, two handmaidens are adorning their lady for a feast—the balls carried on the head are lumps of perfumed unguent. The jars festooned with vines and date clusters contain vintages from the Delta, such as those whose seals were found in the harem quarters at Akhetaton.

LUXURY AND REFINEMENT AT AN EGYPTIAN SOCIAL GATHERING

Upper subjects, British Museum; bottom from drawing by Mrs. N. de G. Davies, courtesy of Dr. A. H. Gardiner

towards perspective; but in the palaces of Amenhotep III and Akhnaton walls and floors too were gaily painted with exquisite flowers and birds and animals in their natural surroundings, and considerable use was made of inlays in faience and even in hard stone most delicately sculptured and engraved, fitted together as a mosaic.

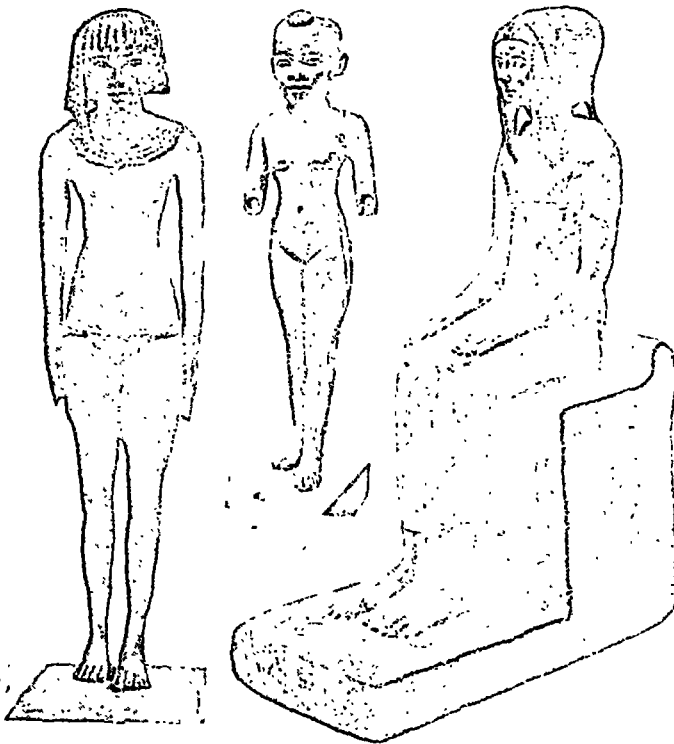
In literature the period of the Empire is not very distinguished. Asiatic wars produced the story of how Thuti, a general of King Thothmes III, captured Joppa by a ruse, introducing armed men in jars, like the Forty Thieves. The great feats of Ramesses II at the battle of Kadesh were celebrated in a poem which was engraved and illustrated



TWO FINE EXAMPLES OF PORTRAIT STATUARY

Neither name nor circumstance of these two ladies, probably princesses, are recorded, but the exquisite workmanship of their statues confers a sort of immortality on them. She holding a bunch of flowers is done in limestone, of 18th Dynasty date; the other, 19th Dynasty, is of creamy alabaster.

British and Florence Archaeological Museums



RESULTS OF A VERSATILE GENIUS

Of ebony, and only about 7 in. high, the statuette of a little negress (centre) shows Egyptian deftness in smaller art. The young girl, left, is a charming figure, while the demure lady on her throne (the grandmother of Aahmes I) is representative of art at the very beginning of the period.

Turin and British Museums

on many of his temples. The story of the Two Brothers is a fairy tale for the nursery, and some love songs with pretty conceits of flowers and bird-catching have come down to us. Much writing was concerned with the education of scribes, chiefly commending diligence and avoidance of the snares of youth in order to escape the rod and eventually rise to a high position.

Of a different order, and probably dating from the very end of our period, when Egypt had been humbled among the nations, is the Teaching of Amenophis, which breathes a spirit of true piety and consideration for one's neighbour. This remarkable composition is cast in a poetical form of couplets and strophes and is divided into chapters. Its sentiments and even its wording agree in many places with parts of the Biblical Book of Proverbs, to such a degree that undoubtedly one

must have been influenced by the other, at least indirectly. This agreement is most conspicuous in Proverbs in the passage from the seventeenth verse of the twenty-second chapter to the twelfth verse of the twenty-third chapter; and perhaps the most striking verbal parallel is the following:

AMENOPHIS

Weary not thyself to be rich. . .
[Ill gotten gains are found to have disappeared in various ways]
Or they have made themselves wings like geese
And have flown to heaven.

PROVERBS 23, 4 (R.V.)

Weary not thyself to be rich;
Cease from thine own wisdom.
Wilt thou set thine eyes upon that which is not?
For riches certainly make themselves wings
Like an eagle that flieth toward heaven.

Amenophis was minister of agriculture, and the son to whom he addresses the Teaching was a priest. Besides Ra, the sun god, the deity most frequently mentioned by name in the Teaching is Thoth,



GRACE OF LATE EMPIRE CARVING

Although all memory of the heretic Akhnaton was banned, the art of his period left its mark. These three heads of mourners in a funerary procession (Nineteenth Dynasty, from Memphis) betray much of the naturalism that he loved.

Berlin Museum

the moon god, patron of scribes and divine recorder, jealous for the honour of the profession, whose manifestation as an ape sat watchful in every government office; but 'God' without qualification is constantly in the mouth of Amenophis. To him the ideal person is the 'tranquil' and contented man as opposed to the 'heated' blustering and ambitious man, who is always in trouble with his neighbours and offensive to the deity.

One of the leading characteristics of Egyptian religion is the way in which it attempts to bind supernatural forces to the will of man by magic formulae and ritual acts. The Egyptian knew right from wrong, and had a very respectable code of morality, but his practice fell far below the ideal. As in ordinary life he would conceal his wrongful acts and would assert his innocence stoutly if accused, only confessing under the torture of the bastinado, so when, after death, he was led to judgement before Osiris, he quite naturally sought to



ROYALTY IN THE INTIMACY OF PRIVATE LIFE

Amazingly intimate for the god-like reserve proper to a Pharaoh, this stele from Akhetaton enables one to realize the break with tradition which Akhnaton fostered. It shows his parents, Amenhotep III and Tiye. Notice the sun disk with the little hands stretching down from it to the king.

Courtesy of Egypt Exploration Society



RETURN OF A FORAGING PARTY

It is to be presumed that these servants are returning from a foraging rather than a hunting expedition, owing to the mixed nature of their bag. One is carrying an antelope, one two hares by the ears, and another several trusses of ripe corn.

British Museum

pass the examination by a Declaration of Innocence (commonly called the Negative Confession), both general and particular, and to restrain his heart from adverse disclosures by pronouncing a long formula.

In fact, until the days of the Nineteenth Dynasty, we do not find any trace of an Egyptian taking a god into his confidence, confessing his sin and asking for forgiveness. But there is a collection of tablets of that period, found in small temples on the west bank of Thebes, wherein some approach is made to this attitude. A god has afflicted a man, who recognizes that the affliction is in consequence of sin against the god; he propitiates the god, the god shows mercy and the man dedicates a tablet acknowledging the divine power and warning all and sundry against incurring the divine wrath.

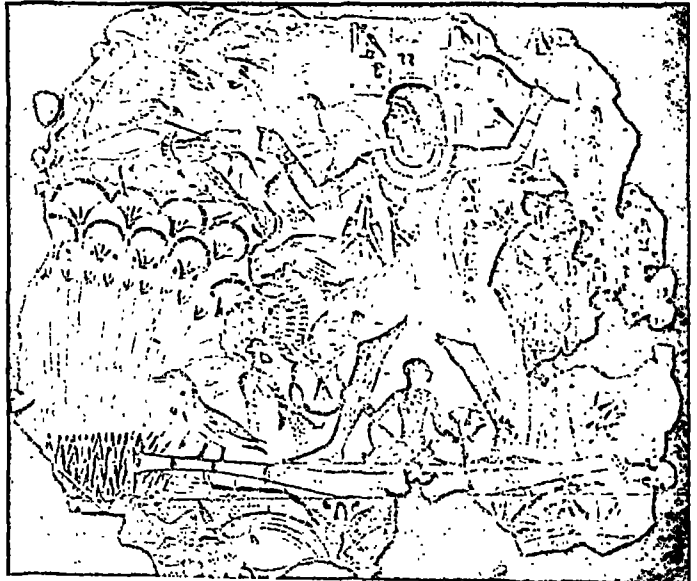
The gods here in question are local, including local forms of Amen and other great gods, and the dedicators belong to the lower classes, workers and priests in the necropolis. With the upper classes there is no such public confession of sin

and forgiveness, or at least none has come down to us. It has even been claimed that the influence of foreign religious thought, more particularly of Semitic religion introduced by slaves and other foreigners dwelling in Egypt, can be detected in this attitude of the man to the divinity. But, after all, it might rather seem to be the confession of sin extracted by divine punishment aided perhaps by priestly pressure.

The priesthood was enormously developed during the Empire to correspond to the vastness of the temples and of their endowments. At the same time the priestly caste became more distinctly marked

off from the laity by regulations such as the shaving of the head. Processions of bare-headed priests carrying the shrine of the deity are a frequent subject of temple sculpture from the Nineteenth Dynasty onward.

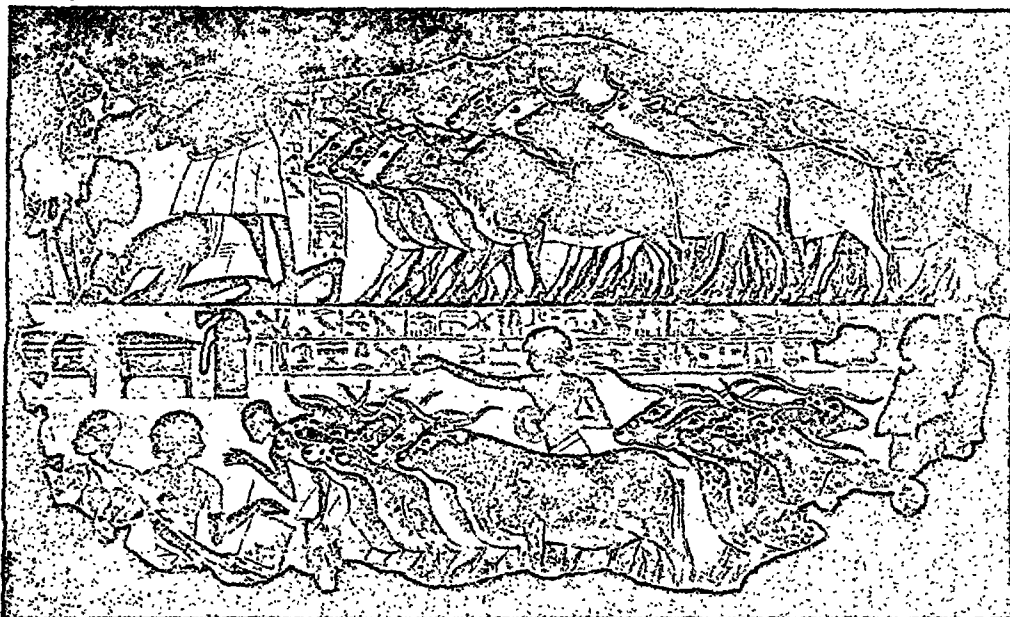
We know almost nothing of Egyptian law, and but few legal documents survive



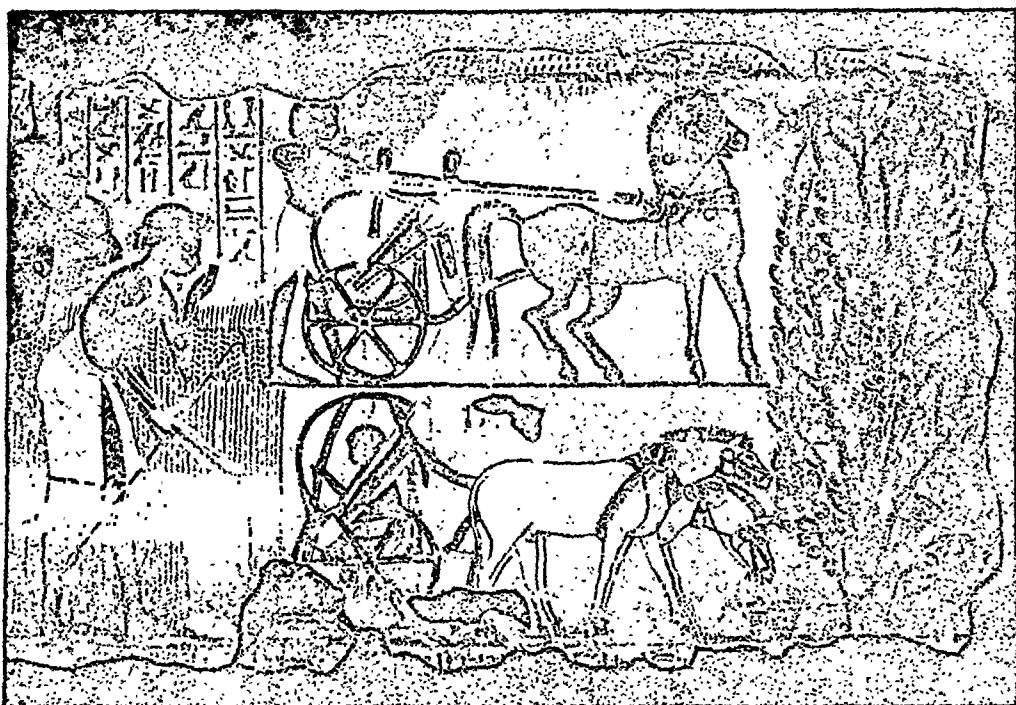
CAT AS MAN'S HUNTING PARTNER

Using methods identical with those of his predecessor more than a thousand years before (see page 484), this Theban noble is out with his wife and daughter after marsh birds in his frail canoe. His hunting cat has seized three birds, in fore-claws, hind-claws and mouth. Note the butterflies.

British Museum



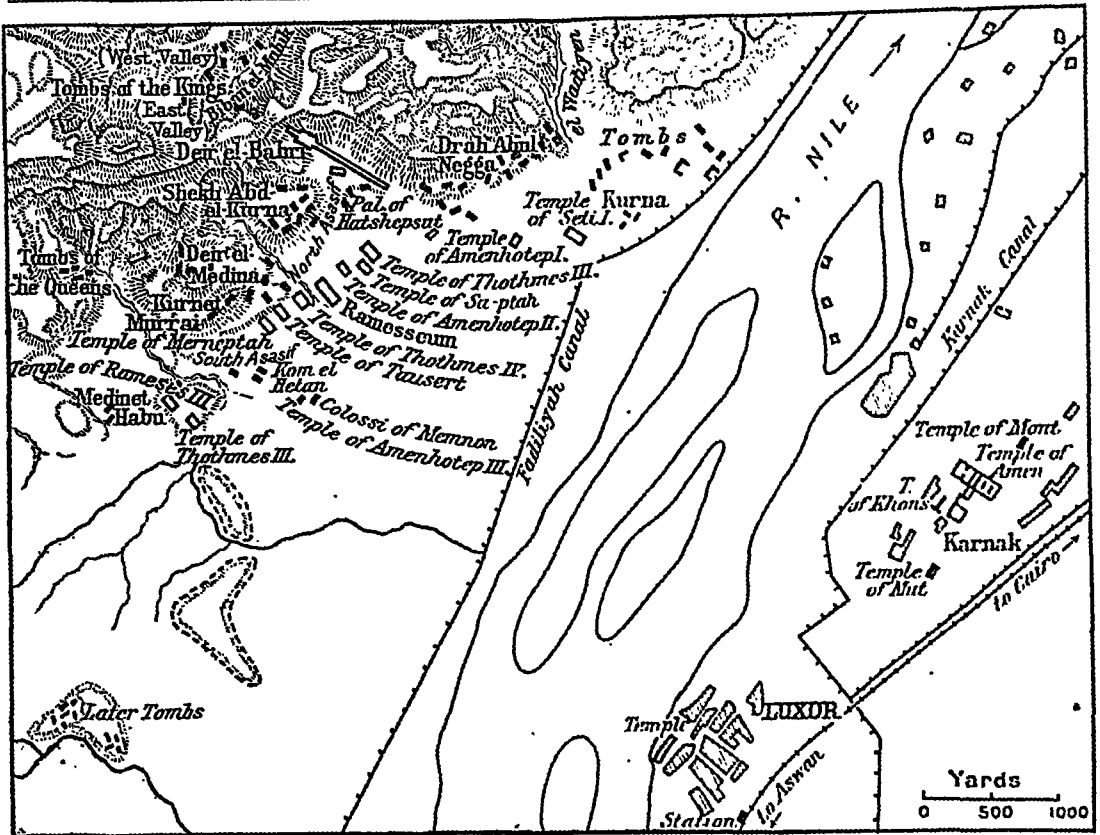
In this tomb painting, of the same period as the one below, the interest is pastoral. A large herd of cattle is about to be penned, but first (upper register) it must be sedulously numbered by the scribe—one of the herdsmen is seen kissing his feet. Underneath, the herd has been divided into groups of five. These scenes are not in relief, but painted on a thin layer of plaster.



In spite of a certain sameness about the subjects selected for tomb decoration throughout the whole of Egyptian history, the slightest inspection serves to distinguish Old Kingdom, Middle Kingdom and Empire technique. There is a softness and elaboration about these Eighteenth Dynasty Theban pieces as compared with earlier work, but at the same time a loss of balance and incisiveness. Above we see two chariots with their grooms and a farm bailiff tasting corn.

AGRICULTURAL SCENES AS PAINTED IN THE GREAT DAYS OF THE EMPIRE

British Museum



CITIES OF THE LIVING AND THE DEAD : SITE OF IMPERIAL THEBES

Thebes, capital of Egypt during its imperial phase, lay on the east bank of the Nile where the villages of Karnak and Luxor are to-day. Almost all that marks the site of the widespread metropolis are the great temples of Amen and his associate deities; but over on the west bank was the city of the dead, and this is still richly represented by the splendid mortuary fanes of the Pharaohs and by their tombs in the Valley of the Kings.

from the period now treated. One may perhaps suppose that contracts, sales of land, etc., were effected in a formal manner before witnesses, but were seldom committed to writing. So also we know nothing of the formalities of marriage. But more than one royal decree has come down to us engraved on stone prohibiting certain acts of violence and injustice or making regulations against commandeering or otherwise interfering with the property and servants of certain temples. The punishment for violation of the rules varies from a bastinado of a hundred blows and opening five wounds in the body of the offender to cutting off his nose and transporting him to the desert frontier, at Sile on the road to Palestine, or even

enslaving his entire family for the benefit of the injured temple.

The administration of criminal law is illustrated for us by reports of the trials of thieves who plundered royal and other tombs in the Theban necropolis towards the end of the Twentieth Dynasty, and of a harem conspiracy against the life of King Rameses III. The examination of suspected persons was carried out with the help of 'beating on their hands and feet.' Rameses III handed over the enquiry into the conspiracy against his life to certain judges, who were charged to acquit those who ought to be acquitted and to put to death those who deserved death, without reference to himself, a most dignified procedure.

Data Entered
END OF FIRST VOLUME

